

INSTRUCTION BOOK

RAILROAD EDITION

No. 17

Ashton Locomotive Pop Safety Valves
Steam and Air Pressure Gages
Dead Weight Gage Testers

THE ASHTON VALVE COMPANY

BOSTON, MASS.

Laude A. Bannell
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INSTRUCTION BOOK

RAILROAD EDITION

No. 17

Containing Useful Information on

SAFETY VALVES AND GAGES
PART LISTS, ETC.

THE ASHTON VALVE COMPANY

OFFICE AND WORKS

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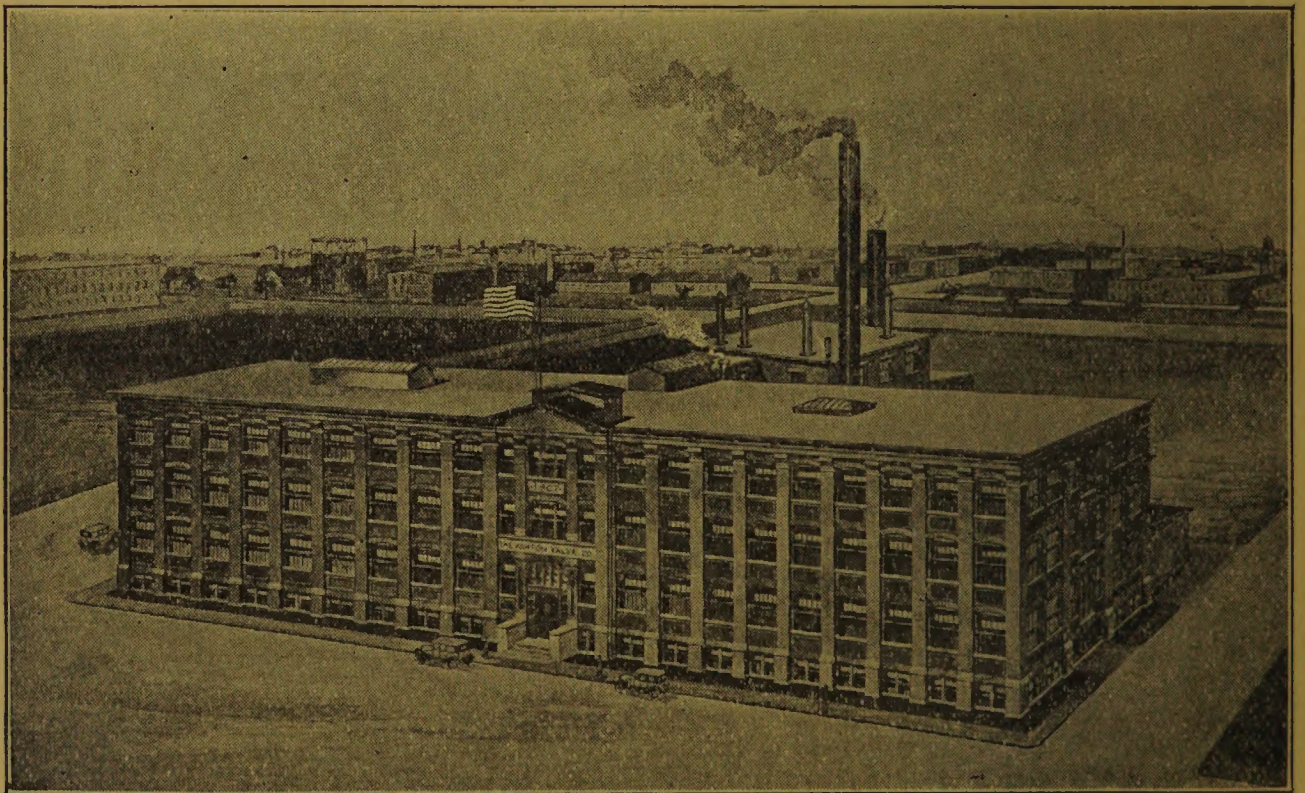
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FRED H. ASHTON
Assistant Treasurer

THE ASHTON

IMPROVED
STANDARD LOCOMOTIVE MUFFLED
AND OPEN POP SAFETY VALVES
LOCOMOTIVE STEAM AND AIR GAGES
IMPROVED DEAD WEIGHT PRESSURE
GAGE TESTERS



MAIN OFFICE AND WORKS

THE ASHTON VALVE COMPANY

161-179 First Street, Cambridge
Boston, Mass.

INTRODUCTION

IN publishing this Instruction Book and Part List we have endeavored to give general information on the Safety Valve and Gage subject, but particularly on our own products of interest to the mechanic repairing and adjusting same, furnishing necessary information to the mechanical and store departments of railroads, and to cover this field briefly but intelligently.

This book is intended as an instruction book and not a catalogue. Many of the articles listed are patented and for information about such articles, reference should be made to our Catalogue No. 28.

We appreciate the possibility of curtailing the following lists of parts, were we to follow practice of some manufacturers who have made frequent changes in design, and after three to five years inform the trade that parts cannot be furnished, as design is obsolete, and advise purchasing complete new article.

We believe our trade will recognize the advantage of being able to secure repairs and appreciate the durable quality of our product that necessitates our listing parts of Safety Valves, etc., designed forty or more years ago, many of which are still in service.

We desire to express our appreciation to those who, by their many evidences of good-will and coöperation, have enabled our business to grow to its present magnitude, and to assure those contemplating business relations with us that no effort will be spared to merit their unqualified confidence.

THE ASHTON VALVE COMPANY.

Cambridge (Boston), Mass., U. S. A.

GENERAL INFORMATION ON SAFETY VALVES

POP SAFETY VALVES must always be applied close to the boiler. Their sensitive action requires close application to maintain constant pressure, and is necessary to keep them positive in action. Never use long nipples or connections with restricted openings, either of which will cause valves to chatter, due to momentary reduction of pressure.

Note: HUMMING OR SINGING VALVES. The prevalent idea that a safety valve is working correctly when repeatedly opening and closing without reduction in pressure of two to three pounds is erroneous. This practice places the valve on a balance, producing rapid wear which soon results in a humming or singing valve. Destruction of valve can be prevented by pop regulators if adjustment is made at once. If allowed to run on a balance the wings will wear rapidly, seats and lip likewise, and the pop regulators will then have no influence.

Small openings into safety valve turrets are frequently the cause of safety valve trouble. (See Report of Safety Valve Committee American Railway Master Mechanics Association, 1912, wherein it is recommended that such shall be equal to the combined area of the necessary safety valves.)

SAFETY VALVES should always be placed in vertical position.

SAFETY VALVE SPRINGS are made special for the size of valve and pressure. They cannot be used for a greater range than fifteen pounds above or below the pressure stamped on them without materially impairing the capacity and regulation of pop control except for pressures over two hundred and fifteen pounds when the range may be twenty pounds. Lighter or heavier springs are required to be fitted for other changes of pressure. Interchanging of springs of various makes should be avoided, owing to the difference in valve construction and special steel used. Screwing down safety springs to make hydrostatic tests, overloads the springs, subjecting them to a strain that may destroy their life and efficiency, and is also a dangerous practice. (See Report Safety Valve Committee American Railway Master Mechanics Association, 1912.)

SPECIAL METAL is used in our valves, and we do not recommend repair parts made of scrap material. Each part purchased from the valve manufacturer is a template to assist in retaining the original lines of construction necessary to successful service.

RECONSTRUCTION. Owing to the requirements of the Federal Laws necessitating railroads to provide additional safety valve capacity to locomotive boilers equipped with old style valves, we have arranged to reconstruct at our factory, at nominal cost,

valves of our make, increasing the capacity from 25 per cent to 50 per cent, as may be required, thus enabling the railroads to continue these valves in service and avoid the expense of new valves.

CAPACITY OF SAFETY VALVES. On pages 28 and 29 will be found a table giving number and size of valves required to relieve locomotive boilers, based upon heating surface and pressure, according to American Railway Master Mechanics' formula, 1912, and with illustrations of our various designs of valves reference is made to table.

SAFETY VALVES SHOULD NOT BE INTERCHANGED on locomotive boilers without regard to their relative capacity, to avoid conflict with Federal laws.

INSTRUCTIONS FOR ORDERING SAFETY VALVES AND PARTS

COMPLETE VALVES. Always give size of valve (note below), style, pressure and connections desired. Cuts of the several style valves, numbered, are shown on following pages, also part lists to enable those ordering to select proper material.

BOTTOMS. Give size of valve, style and connections, specify diameter and number of threads per inch if connection is special. (See following illustrations for standard female connections, which will be furnished unless otherwise specified.)

SPRINGS. Give size of valve, style, pressure, spring length and inside diameter.

WING VALVES. (See cuts for proper reference.) Wing valves furnished for renewals are left rough turned on wings $\frac{1}{16}$ of an inch full, to be fitted to bottoms.

ALL PARTS. Give size of valve, style, and both letter and name of part wanted.

Note: Size of valve is not determined by the connection, but measured across the inside diameter of the seat or section into which the wing valve fits.

SHOP NUMBERS are stamped on head section near bottom. If in doubt regarding style of valve, give shop number as reference.

SHIPMENTS. Always specify routing: freight, express or parcel post. All parcel post shipments are insured, and at customer's expense.

TO AVOID ERRORS and annoying delays, customers should be as careful and specific in writing their orders as they expect us to be in filling them.

THE ASHTON LOCOMOTIVE POP SAFETY VALVES

THEIR DESIGN AND DESCRIPTION

The several designs of Open Pop and Muffled Safety Valves illustrated and described on the following pages mark the strides of improvements that have been made to meet the changed conditions of time. Each has fulfilled its purpose and in turn contributed to the unequalled reputation and durability so generally acknowledged, of the Ashton Safety Valves. Their principal points of construction are clearly illustrated and briefly explained as a matter of instruction that will be found useful to all those who desire a more complete knowledge of them than is given in our regular catalogue and other printed matter.

The springs used in Ashton Valves are of the highest grade, both as to quality of material and workmanship, it being a recognized fact that the durability and efficiency of safety valves are largely dependent upon their springs. We positively guarantee our springs for five years' service when they are used at the pressures for which they are designed.

The Ashton method of pop regulation from the outside of the valve body is positive, effective and always operative. It requires no special wrenches or other devices to make any desired adjustment of the blow-back, and, being located at the top part of the valve body, is most readily accessible. These essential and desirable features are found exclusively in Ashton Valves.

We also invite attention to a comparison of the weights of our valves with those of other makes, and to the thickness of metal under the seats and through the wing valves, the points most subject to wear in service. The exceptional durability of Ashton Valves, as proved by an experience of over half a century, fully warrants our claim that they will run longer without adjustment or repairs and require less attention than any other valve on the market.

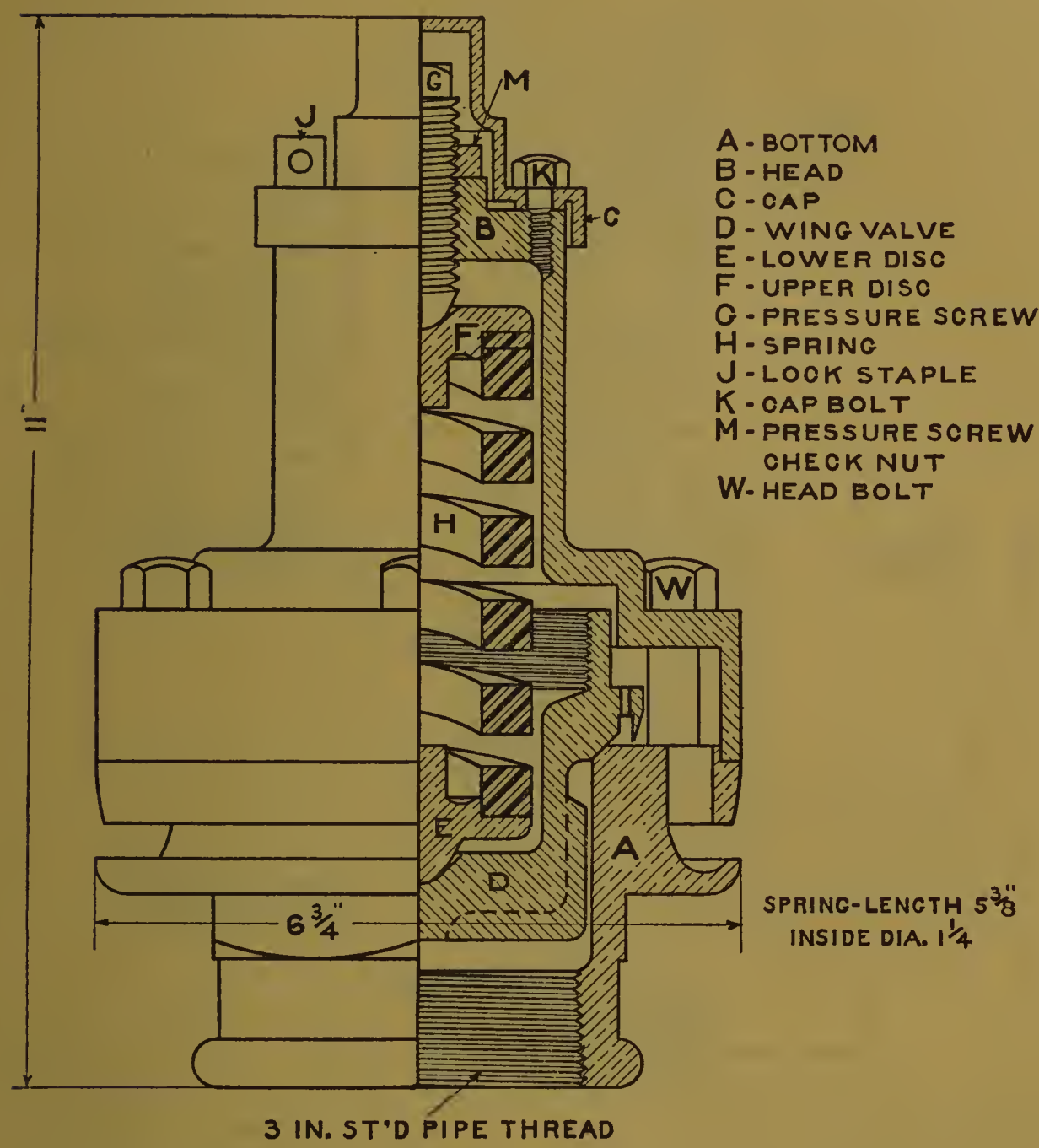
As a record in safety valve economy, the average cost of renewals and repair parts per valve per year on three large railroads using Ashton Valves exclusively has been twenty-three cents on approximately four thousand valves, some of which are over thirty years old.

In efficiency we guarantee Ashton Valves to give a capacity of relief equal to any and sufficient to relieve any locomotive boiler fully and satisfactorily. We make our own experiments and thoroughly test our valves before offering them to railroads. To our conservative methods we largely owe our success.

We will send one or more of our different styles of locomotive valves on trial, subject to approval, only if satisfactory after actual service test. A trial set of these valves, of the size we recommend, we guarantee will relieve the boiler, require less attention, and stay out of the shop longer than any other safety valve on the American market.

ASHTON OPEN POP SAFETY VALVES

STYLE No. 26 C. SIZE, 3½ INCHES

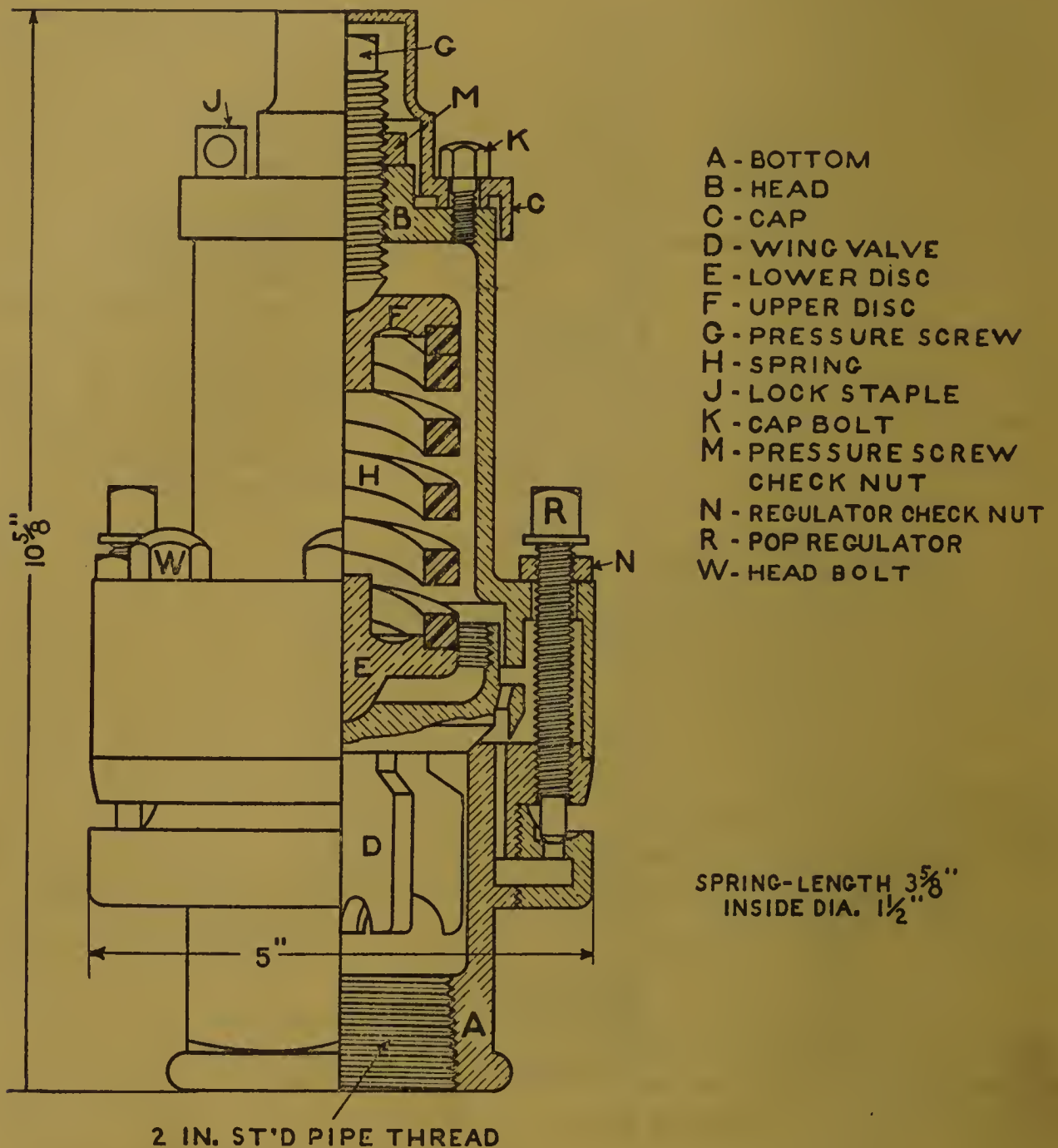


No. 26 C — OPEN POP OLD STYLE. Same design as No. 26 B excepting wing Valve, which is the drop-center type, so constructed to increase the length of the spring and place the pivot point of lower spring disc below the valve seat, with the object of producing a balanced and more sensitive valve. Contrary to first impression, this style wing valve does not retard the capacity on a moderate lift valve.

	Page
List Prices of Parts	43
Illustration of Wing Valve	30
General Instructions	34, 35
Special Instructions	37

ASHTON OPEN POP SAFETY VALVES

STYLE No. 28. SIZE, 2½ INCHES

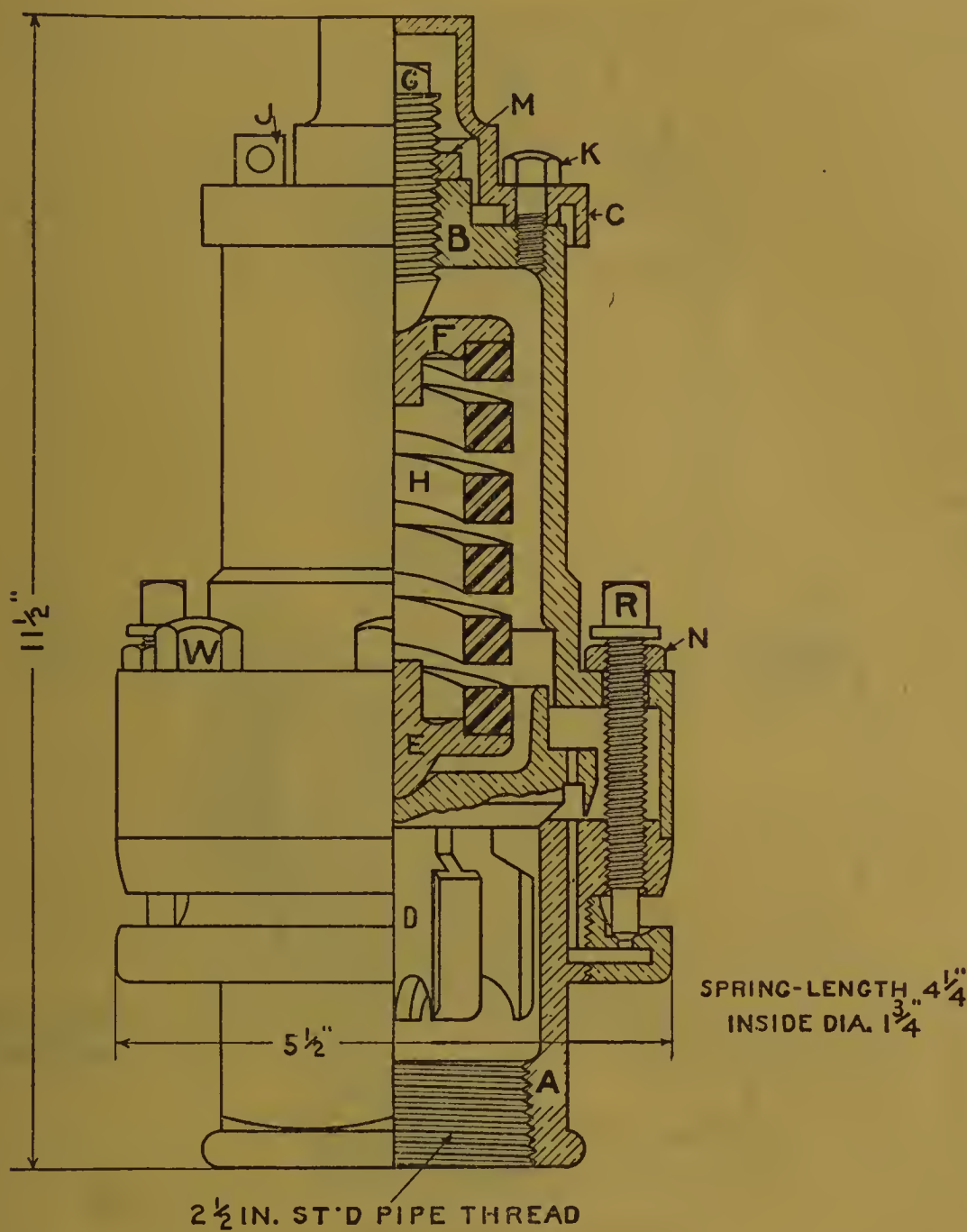


No. 28 Open Pop with outside pop regulators, bolted body type, is illustrated herewith, and shown in its various sizes on the following pages: 9, 10, 11 and 12. The introduction of this valve many years ago solved the problem of a practical method of controlling the pop or blow-back of a locomotive safety valve while under steam without danger to the workman.

	Page
List Prices of Parts	43
Illustration of Wing Valve	31
General Instructions	34, 35
Special Instructions	37

ASHTON OPEN POP SAFETY VALVES

STYLE No. 28. SIZE, 3 INCHES



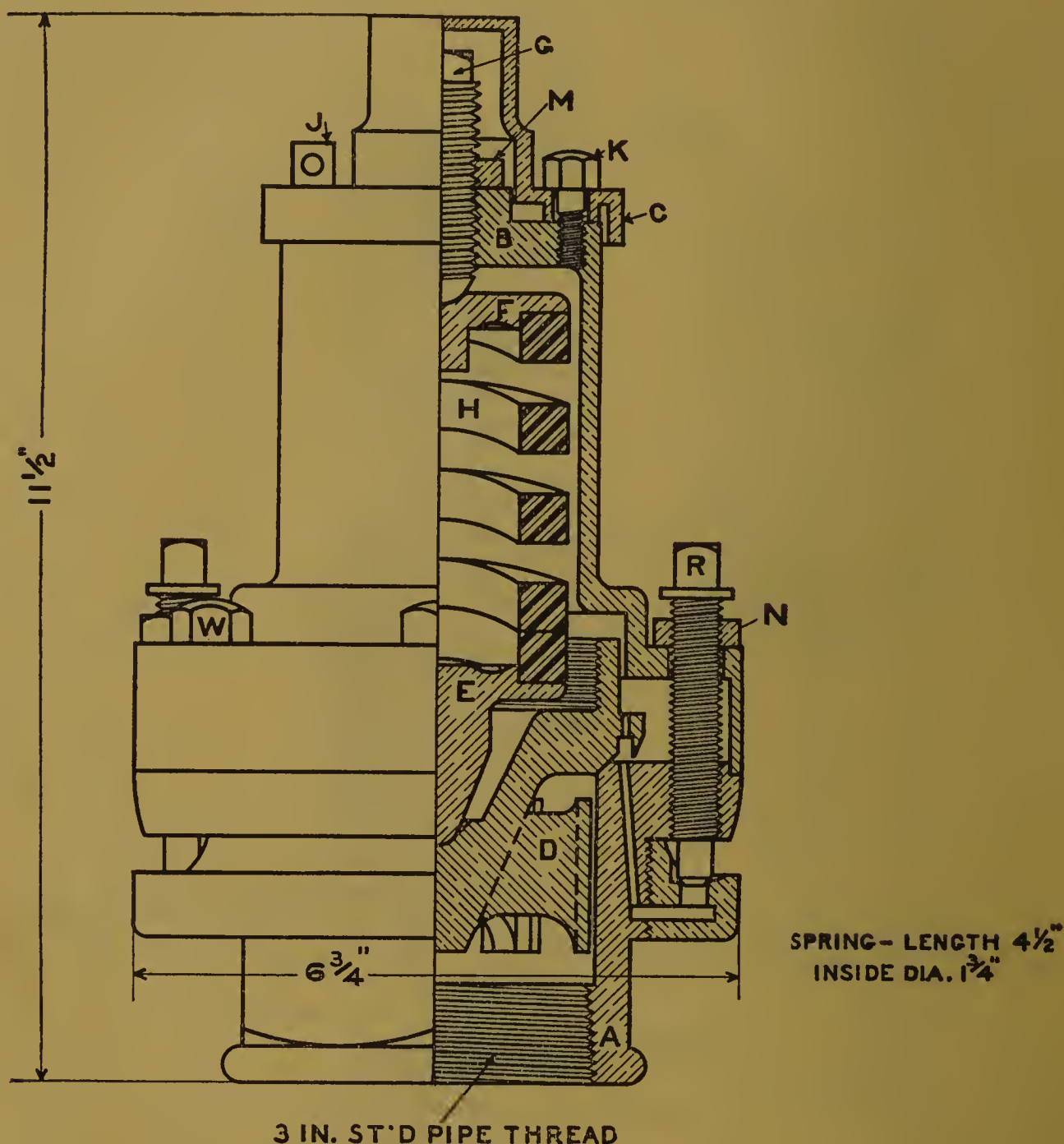
The No. 28 Open Pop Valve, as will be observed, embodies one of the most essential features in safety valve construction, i. e., a practical and efficient provision for pop regulation, which gives a reliable method of controlling the blow-back, that is readily accessible to those making the adjustments. The Ashton regulation requires no special wrenches; no rings nor sleeves to raise or lower that are invariably corroded and immovable. There is no outside casing to be moved that may be damaged by wrenches in removing or applying the valve.

The spring, spring discs, wing valve and pressure screw interchange with the 3 in. No. 30 Muffled Valve shown on page 18.

	Page		Page
List Prices of Parts	43	General Instructions	34, 35
List of Parts	8	Special Instructions	37
Illustration of Wing Valve	30		

ASHTON OPEN POP SAFETY VALVES

STYLE NO. 28. SIZE, 3½ INCHES

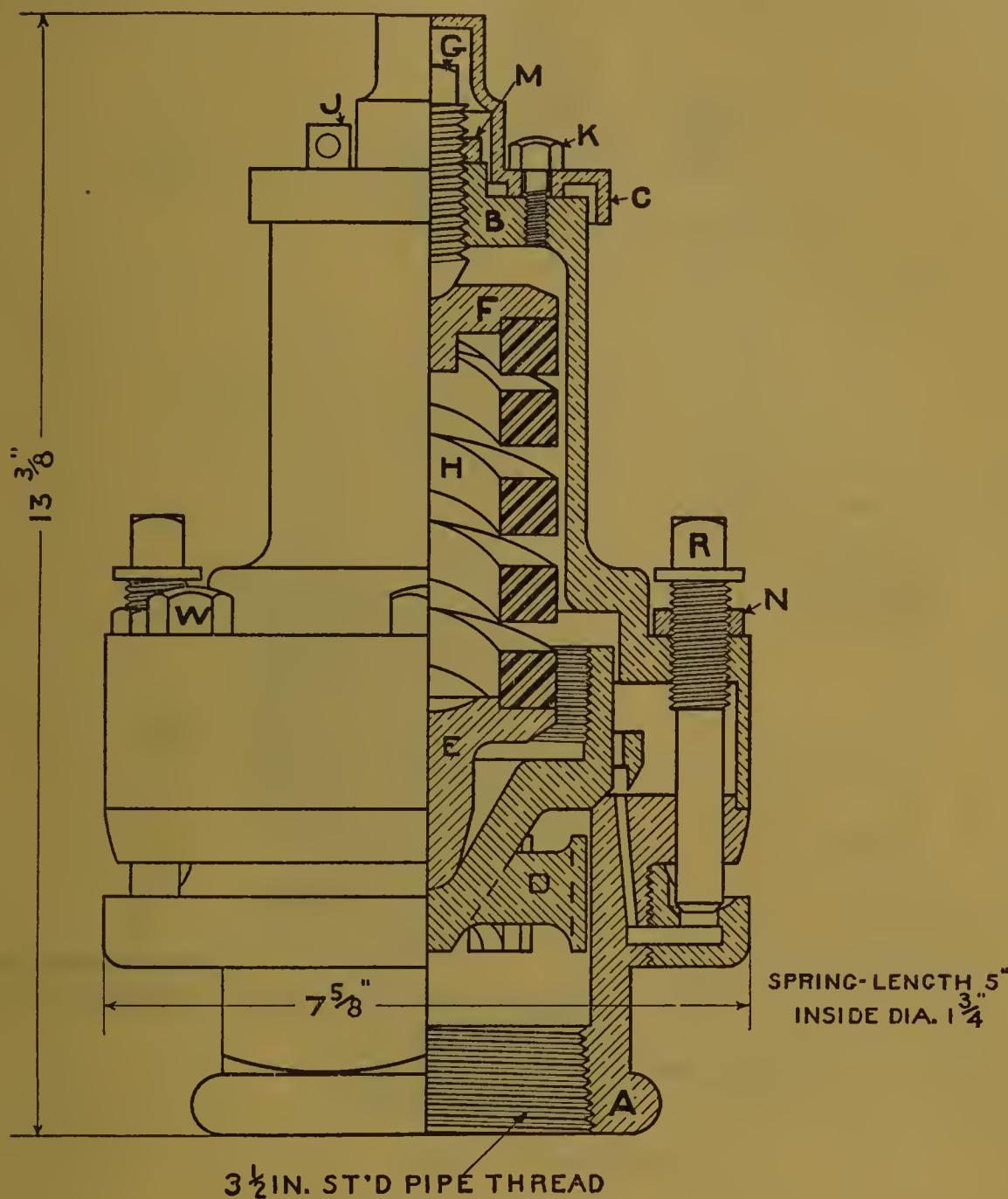


The No. 28 style Open Pop Valve stands without a peer in points of construction and durability. In 1912 the 3½ in. No. 28 Valve was changed and made with enlarged spring and head, as above shown, so that these parts now interchange with the 3½ in. No. 30 Muffled Valve shown on page 19. The former design of this valve is the No. 28A style on page 12.

	Page
List Prices of Parts	43
List of Parts	8
Illustration of Wing Valve	30
General Instructions	34, 35
Special Instructions	37

ASHTON OPEN POP SAFETY VALVES

STYLE No. 28. SIZE, 4 INCHES

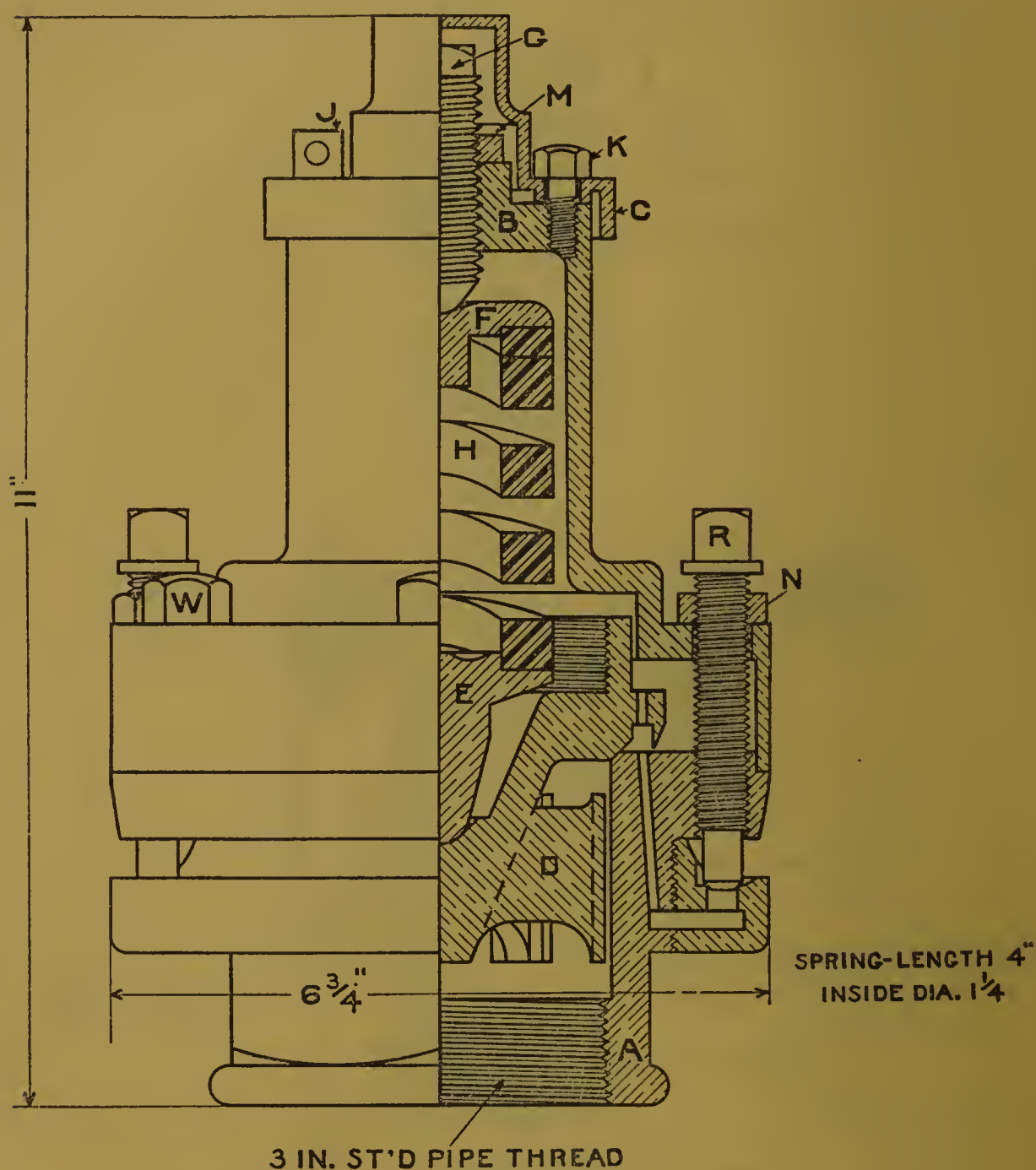


For a moderate lift valve the No. 28 style Open Pop has no equal in reputation on the railroads of this or foreign countries, and is in large demand at the present time. In the 4 inch size, above shown, the wing valve, spring, spring discs, and pressure screw interchange with the 4 inch No. 30 Muffled Valve on page 20. The wing valves of all the larger sizes are furnished with reinforced lower wing guides.

	Page
List Prices of Parts	43
List of Parts	8
Illustration of Wing Valve	30
General Instructions	34, 35
Special Instructions	37

ASHTON OPEN POP SAFETY VALVES

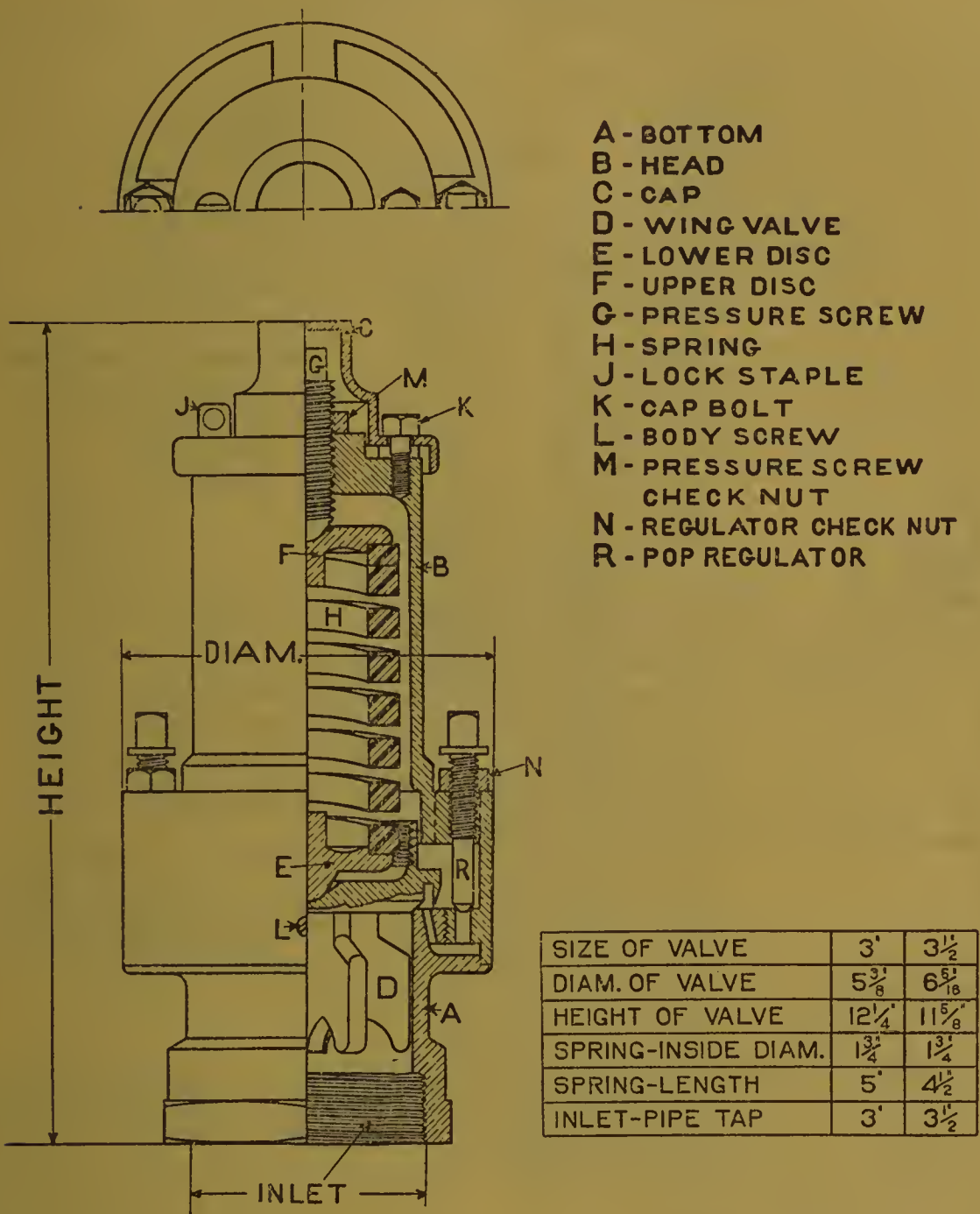
STYLE No. 28A. SIZE, 3½ INCHES



The No. 28A style Valve, as shown above, is not now one of our regular styles having been superseded by the 3½ inch No. 28 Valve, shown on page 10, which has larger spring and top. We are prepared, however, to furnish any repair parts required, and, if desired, can supply the No. 28 style spring and top to fit this valve.

	Page
List Prices of Parts	43
List of Parts	8
Illustration of Wing Valve	30
General Instructions	34, 35
Special Instructions	37

ASHTON OPEN POP SAFETY VALVES
STYLE No. 28B

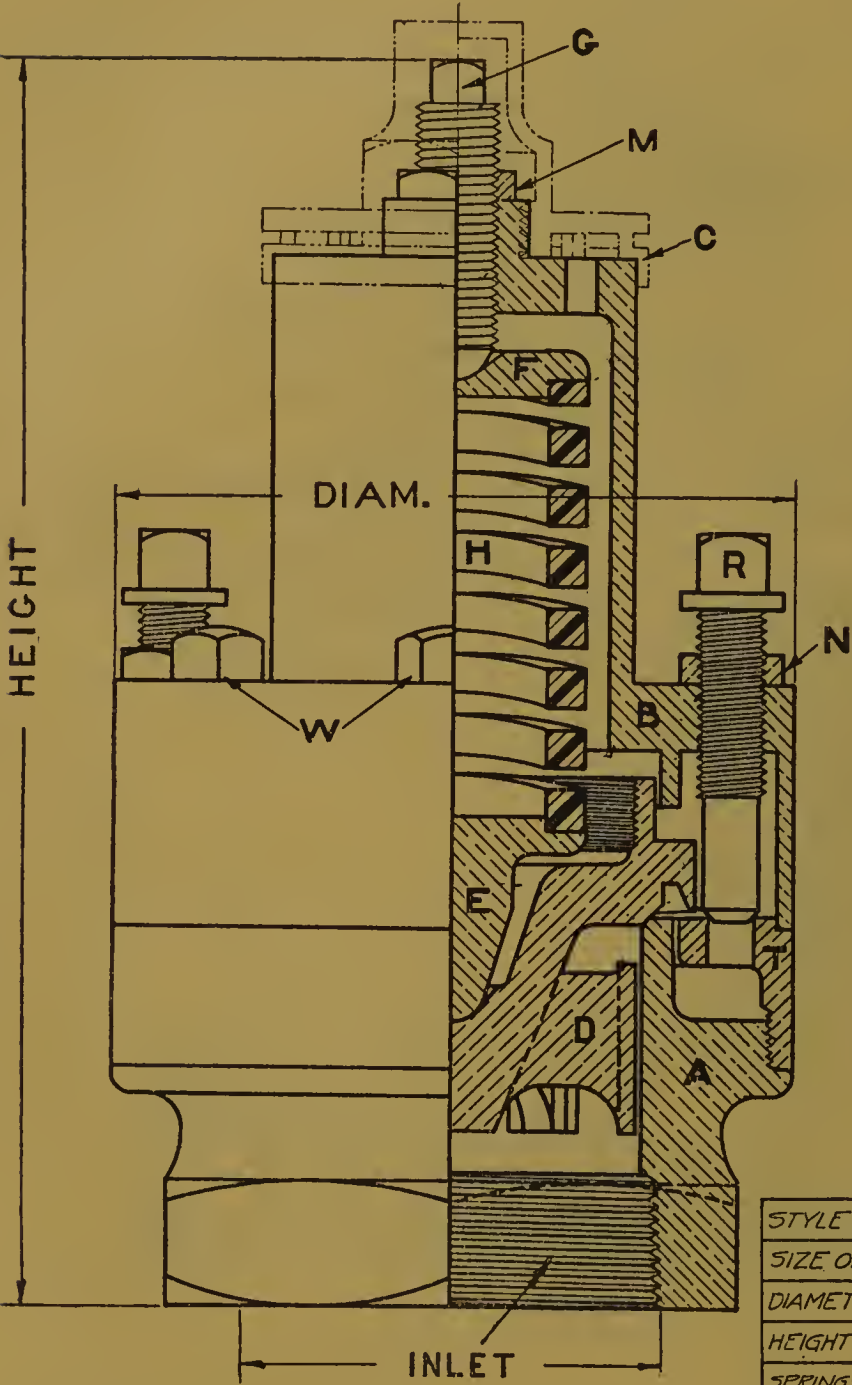


No. 28B Open Pop, outside pop regulators, top discharge, screwed body type. The design of this valve is similar to the No. 28 with the exception of the top discharge, as noted above. As a rule it is made with standard pipe thread connections, same size as valve. Having a top discharge, its capacity is slightly in excess of the No. 28 style.

	Page
List Prices of Parts	43
Illustrations of Wing Valves	30, 31
General Instructions	34, 35
Special Instructions	39
Muffled Style	25

ASHTON OPEN POP SAFETY VALVES

STYLE No. 28 M. M. 3 AND 3½ INCH
No. 28 M. M. B. 2½ AND 4 INCH
No. 28 U. S.



- A Bottom
- B Head
- C Cap
- D Wing Valve
- E Lower Disc
- F Upper Disc
- G Pressure Screw
- H Spring
- M Pressure Screw Check Nut
- N Regulator Check Nut
- R Pop Regulator
- T Base Ring
- W Head Bolt

	Page
List Prices of Parts	42
Illustrations of Wing Valves	31
General Instructions	34, 35
Special Instructions	37
Capacity Chart	28, 29
Discharge Capacity	27

Note: 3" and 3½" number 28 U. S. Style Valves take same parts as number 28 M. M. Style.

STYLE OF VALVE	28MM	28MMB	28MM	28MM	28MM	28MMB
SIZE OF VALVE	2½"	2½"	3"	3½"	4"	4"
DIAMETER OF VALVE	5½"	5½"	6"	6⅞"	7⅞"	7⅞"
HEIGHT OF VALVE	10½"	10½"	11½"	11⅝"	12½"	12½"
SPRING-INSIDE DIAM.	1½"	1½"	1¾"	1¾"	2"	2¼"
SPRING-LENGTH	3⅝"	3⅝"	4¼"	4½"	5"	5"
INLET-PIPE TAP	2½"	2½"	3"	3½"	4"	4"

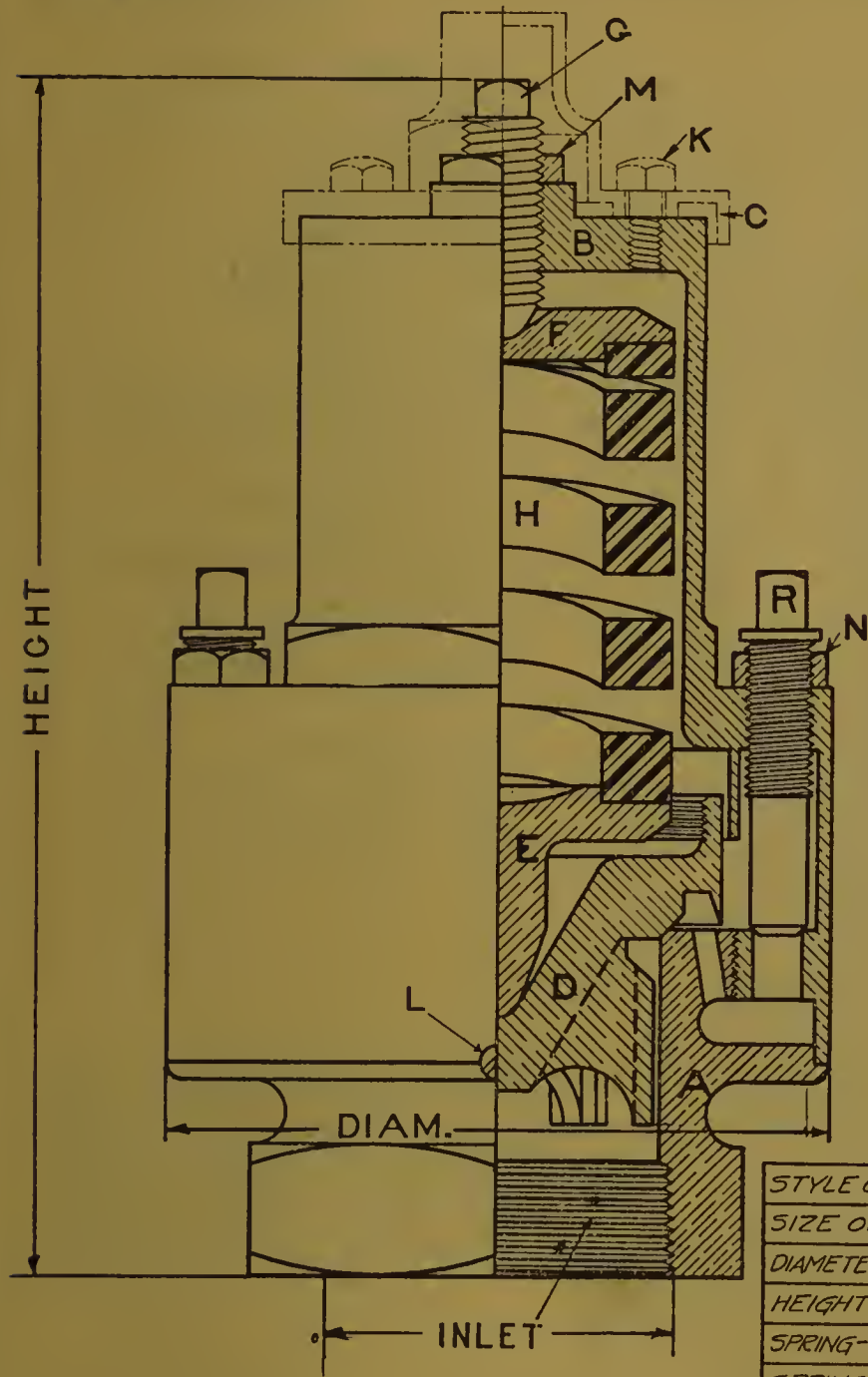
The No. 28 M. M. and 28 M. M. B. (Master Mechanics) Open Pop Valves, above shown, have outside pop regulators, top discharge, and are of the bolted body type. They are constructed strictly in accordance with the recommended practice of the Committee on Safety Valves of the American Railway Master Mechanics Association of 1912, having hexagon of standard wrench size; standard pipe thread connection of same size as valve; .10 valve lift so stamped upon valve; and 46° seat.

In designing these valves we have followed the construction of the No. 28 style, so offer railroads no experiment, and can without qualification recommend them. The wing valves, springs, spring discs, caps, pressure screws, and lock nuts interchange in the several sizes with those of the No. 30 M. M. and 30 M. M. B. Mufflers on page 22, thus reducing the number of spare parts required in store department.

ASHTON OPEN POP SAFETY VALVES

STYLE No. 28 I. L.

No. 28 I. L. A. 3 INCH



- A Bottom
- B Head
- C Cap
- D Wing Valve
- E Lower Disc
- F Upper Disc
- G Pressure Screw
- H Spring
- K Cap Bolt
- L Lock Screw
- M Pressure Screw Check Nut
- N Regulator Check Nut
- R Pop Regulator

	Page
List Prices of Parts	42
Illustrations of Wing Valves	31
General Instructions	34, 35
Special Instructions	39
Capacity Chart	28, 29
Discharge Capacity	27

STYLE OF VALVE	28 I. L.	28 I. L.	28 I. L. A.	28 I. L.	28 I. L.
SIZE OF VALVE	2 1/2"	3"	3"	3 1/2"	4"
DIAMETER OF VALVE	6"	6 1/2"	6 11/16"	7 1/8"	8 5/8"
HEIGHT OF VALVE	11 5/8"	12 1/2"	12 1/2"	13 3/8"	13 3/4"
SPRING-INSIDE DIAM.	1 3/4"	2"	2 1/4"	2 1/4"	2 1/4"
SPRING-LENGTH	4 1/2"	5"	5"	5 1/2"	5 1/2"
INLET-PIPE TAP	2 1/2"	3"	3"	3 1/2"	4"

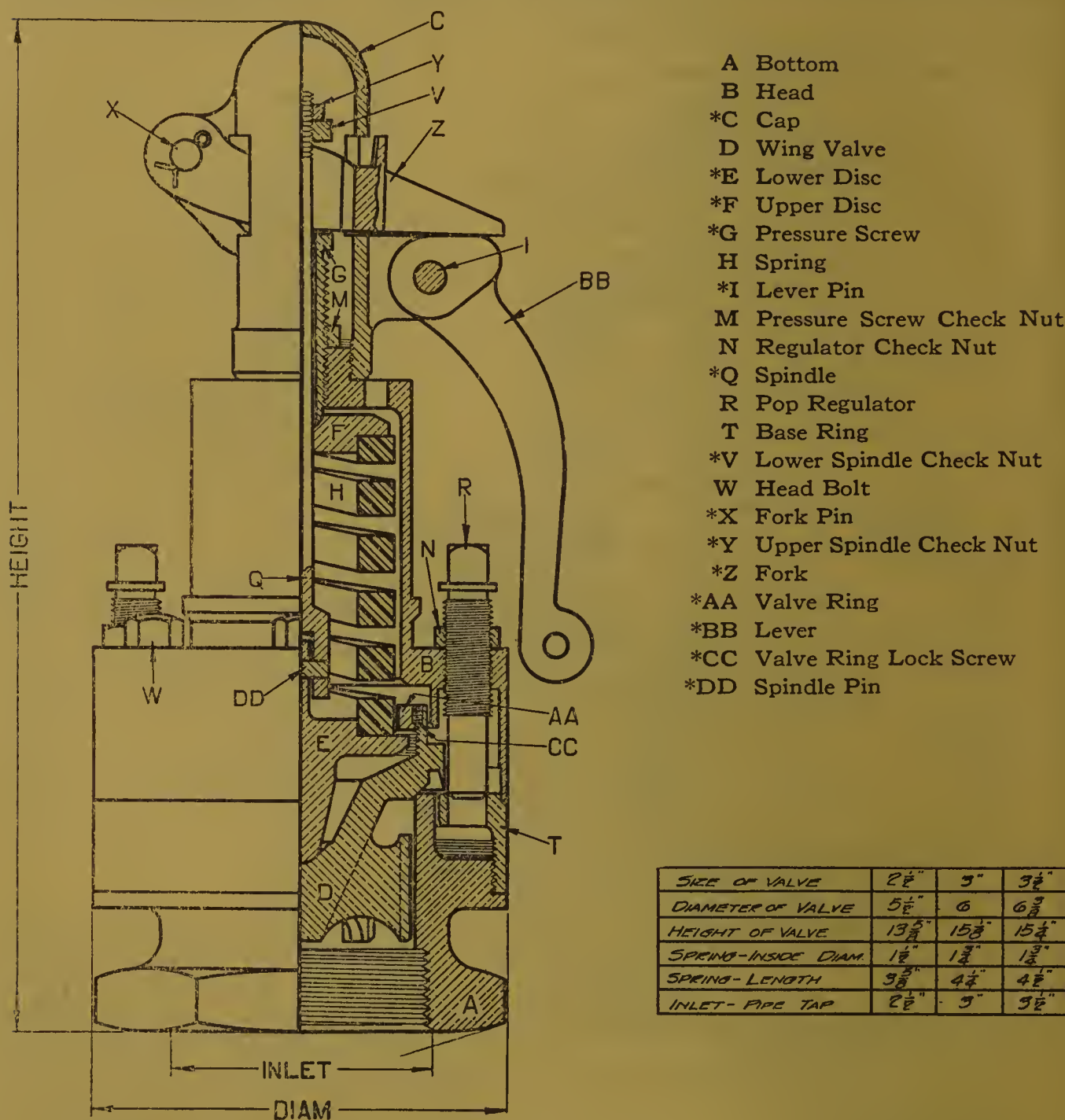
The No. 28 I. L. and 28 I. L. A. (Increased Lift) Open Pop Valves, above shown, have outside pop regulators, top discharge, and are of the screwed body type. They were designed and introduced by us several years ago to meet a condition confronting the Mechanical Departments of railroads by the increased size of locomotive boilers, and to overcome the objection in some cases to the increase in size or number of moderate lift safety valves otherwise necessary.

In the design and construction of these valves we have given due consideration to the exacting conditions imposed by their increased capacity. With a liberal distribution of metal and over one half century of experience to guide us, we have, by following closely the design of the No. 28 style, produced and thoroughly tested valves equal in capacity to any on the market, and invite a comparison to prove that they will give longer service without adjustment or repairs.

These valves have full size inlet connection and the interior working parts interchange with the No. 30 I. L. and 30 I. L. A. Muffled Valves on page 23.

ASHTON OPEN POP SAFETY VALVES

STYLE No. 28 M. M. A.



No. 28 M. M. A. Open Pop, Cam Lever, bolted body type, is similar in design to the No. 28 M. M. on page 14. This valve, which supersedes the No. 29, is shown for the benefit of those who wish a cam lever valve to permit blowing down the pressure through the safety valve instead of through the blow-off cock and has the same good features as the No. 28 M. M., with the addition of the lever parts.

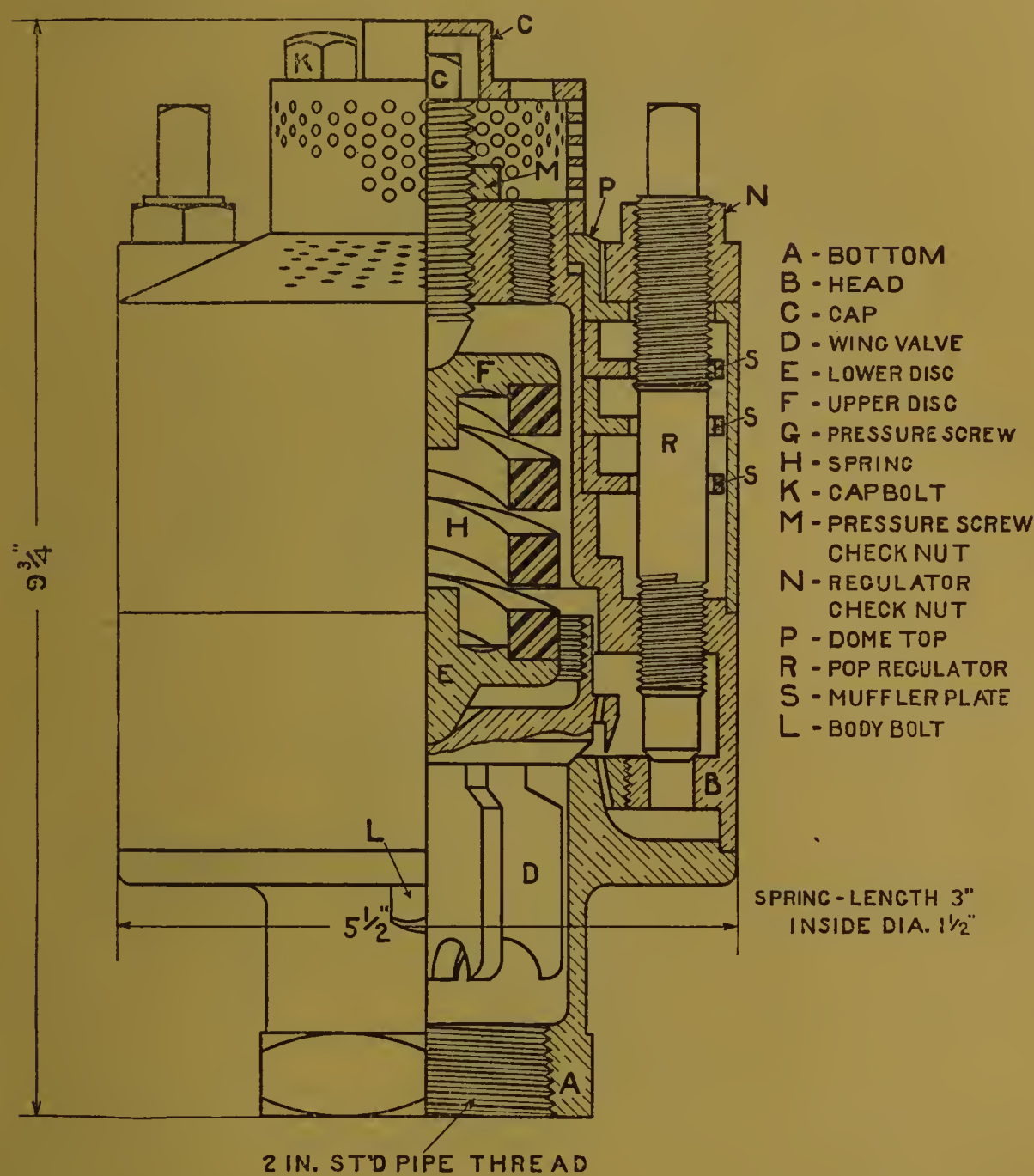
It complies with the rules of the states requiring cam lever valves.

	Page
Illustrations of Wing Valves	31
General Instructions	34, 35
Special Instructions	37
Capacity Chart	28, 29

*List prices of cam lever and attachments on application. Other parts same as 28 M. M.

ASHTON MUFFLED POP SAFETY VALVES

STYLE No. 30. SIZE, 2½ INCHES



The 2½ inch No. 30 Muffled Valve, with outside pop regulators, shown above, is same as the No. 30 Valves on following pages, but constructed of the screwed body type.

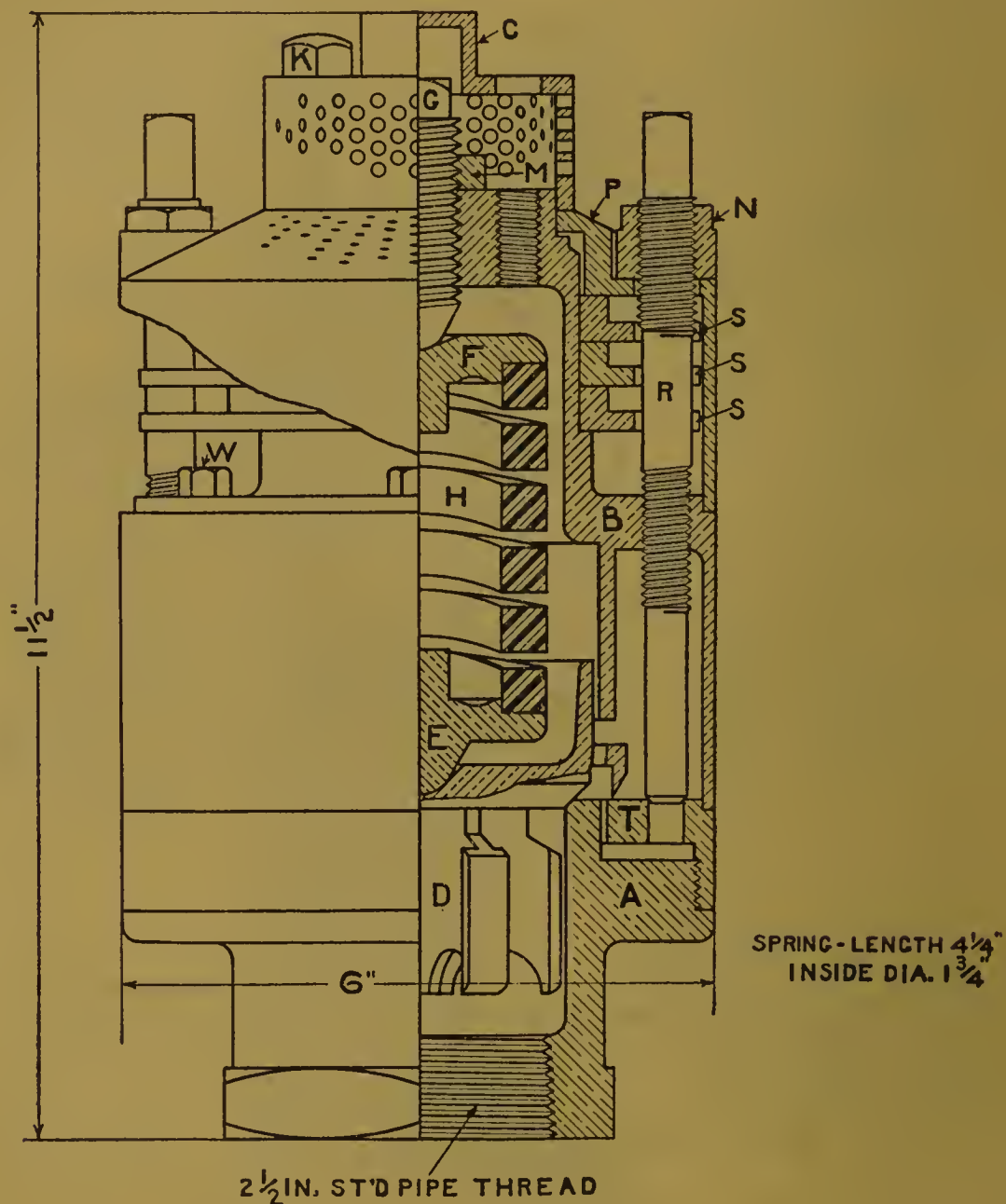
All No. 30 Ashton Muffled Valves are so arranged that in bad water districts, where there is a possibility of the baffle plates filling up with lime and sediment, the dome top and baffle plates can be easily removed for examination or cleaning while the locomotive boiler is under steam, and if necessary the locomotive could make a trip without these parts.

Latest style valve has slots instead of drilled holes in cap and dome top.

	Page
List Prices of Parts	43
Illustration of Wing Valve	30
General Instructions	34, 35
Special Instructions	39

ASHTON MUFFLED POP SAFETY VALVES

STYLE No. 30. SIZE, 3 INCHES



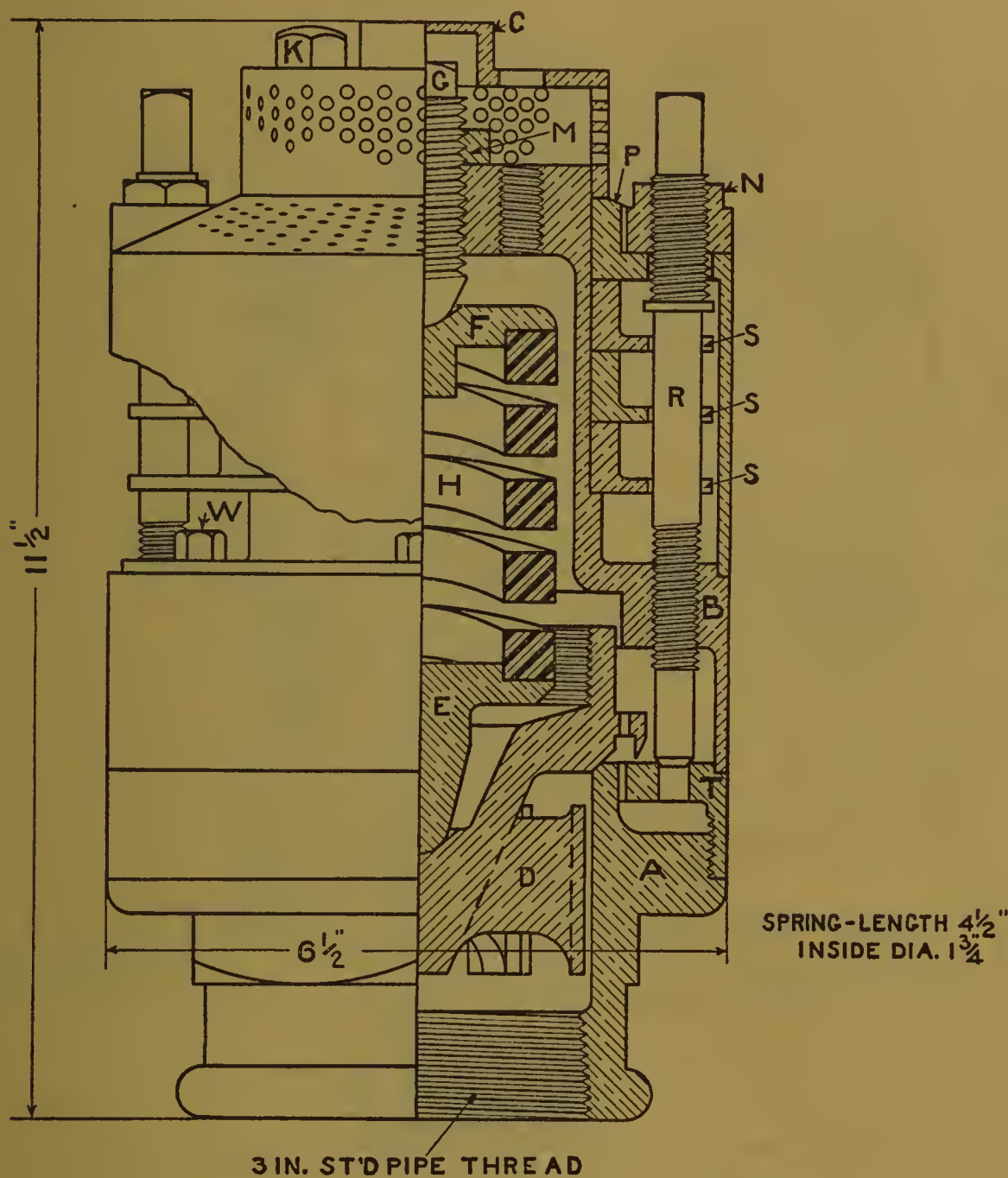
No. 30 Muffled Valve, with outside pop regulators, bolted body type, is shown herewith and on pages 19 and 20. Ever since the introduction of the first Ashton Patented Muffled Valve there has been a steady and ever-increasing interest among railroads in the adoption of this style valve, until now it is by far the greatest in demand. The quiet yet efficient relief given by the muffler in contrast with the noisy open pop valve is universally appreciated, and railroads are fast adopting muffled valves for the working valves on their locomotives.

Latest style valve has slots instead of drilled holes in cap and dome top.

List Prices of Parts	Page
List of Parts	43
Illustration of Wing Valve	21
General Instructions	30
Special Instructions	34, 35
Open Pop Style	37
	9

ASHTON MUFFLED POP SAFETY VALVES

STYLE No. 30. SIZE, 3½ INCHES



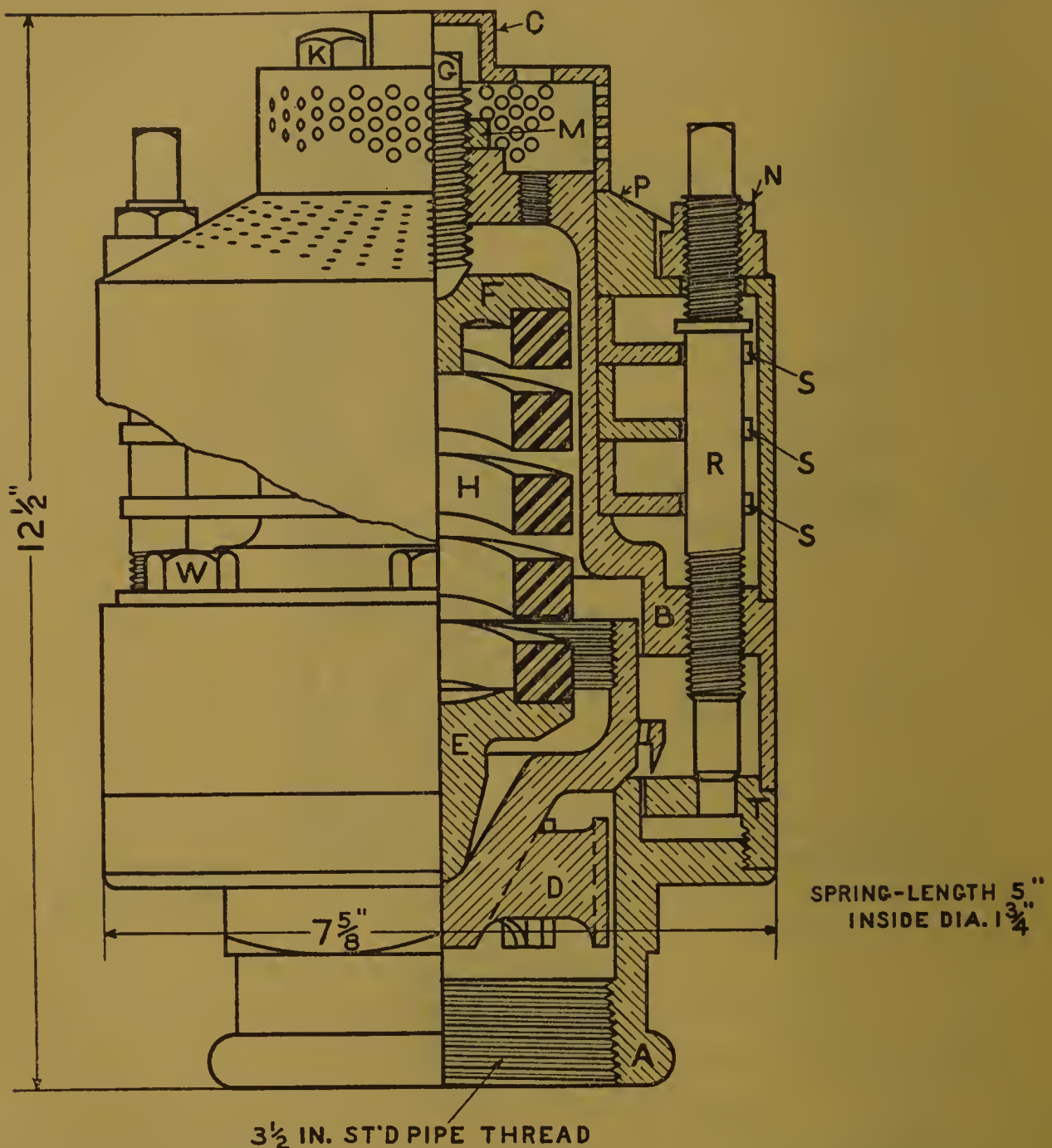
The muffling of a safety valve, as with the Ashton Muffled Valve, is recognized as a necessity in modern railroad practice to prevent annoying the public around stations and yards and in passing through residence districts. This is produced by baffle plates and expansion chambers, which necessarily retard the discharge capacity of the valve, and the muffled effect produced is therefore in direct relation to the steam discharged. To increase the capacity of the valve with higher lift without increasing the diameter or height of the expansion chambers is to increase the noise and sacrifice the purpose for which a muffled valve is designed.

Latest style valve has slots instead of drilled holes in cap and dome top.

List Prices of Parts	Page 43	General Instructions	Page 34, 35
List of Parts	21	Special Instructions	37
Illustration of Wing Valve	30	Open Pop Style	10

ASHTON MUFFLED POP SAFETY VALVES

STYLE NO. 30. SIZE, 4 INCHES

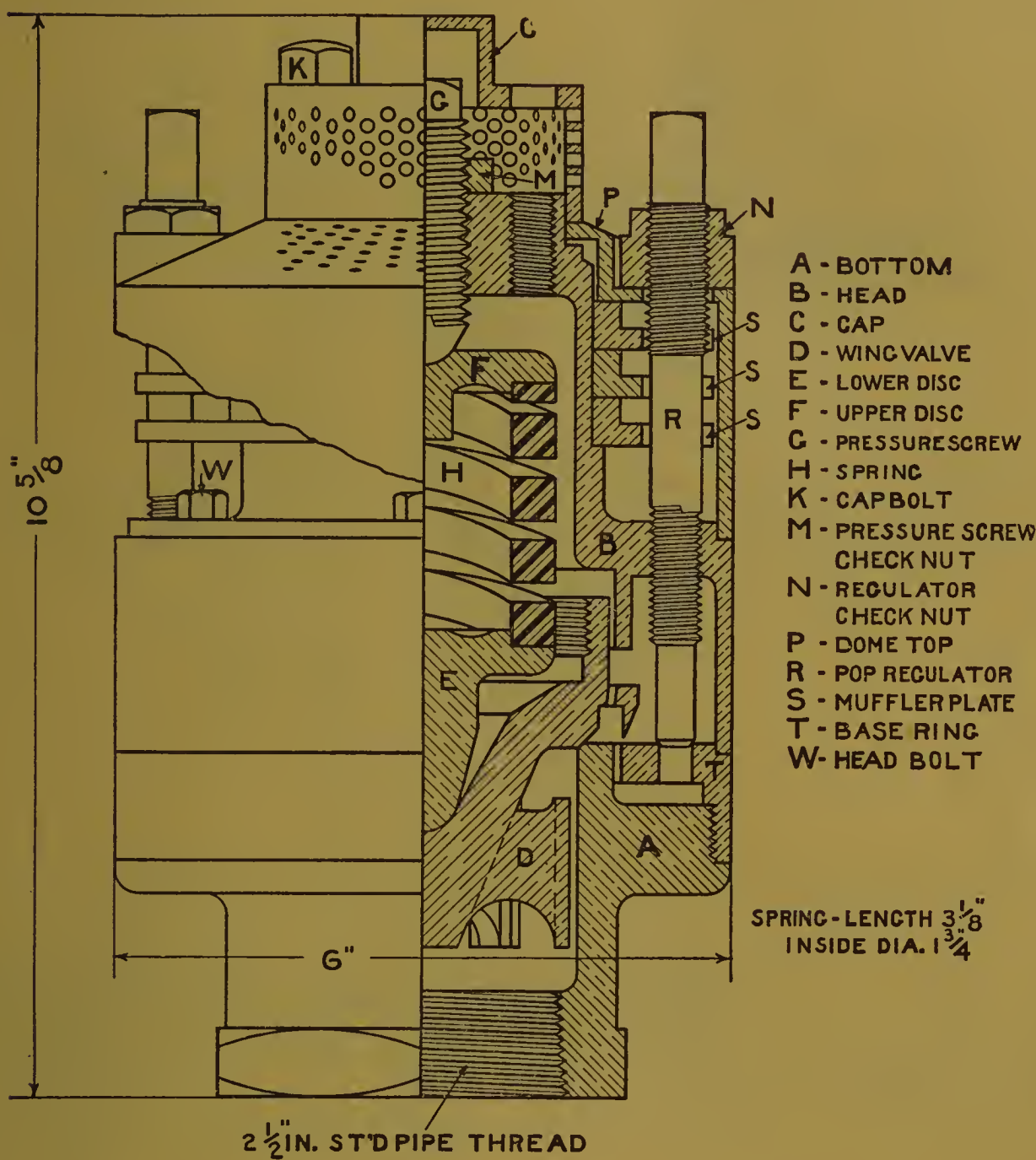


The No. 30 Muffled Valves, like the No. 28 Open Pops, have stood the test of time. They have no equal for durability or muffled effect in proportion to their capacity. The wing valves are furnished with reinforced lower wing guides in all the larger sizes. The springs, spring discs, wing valves, and pressure screws interchange in the 3 inch, 3½ inch, and 4 inch sizes with those of the No. 28 Open Pops.

Latest style valve has slots instead of drilled holes in cap and dome top.

	Page		Page
List Prices of Parts	43	General Instructions	34, 35
List of Parts	21	Special Instructions	37
Illustration of Wing Valve	30	Open Pop Style	11

ASHTON MUFFLED POP SAFETY VALVES
STYLE No. 30C. SIZE, 3 INCHES



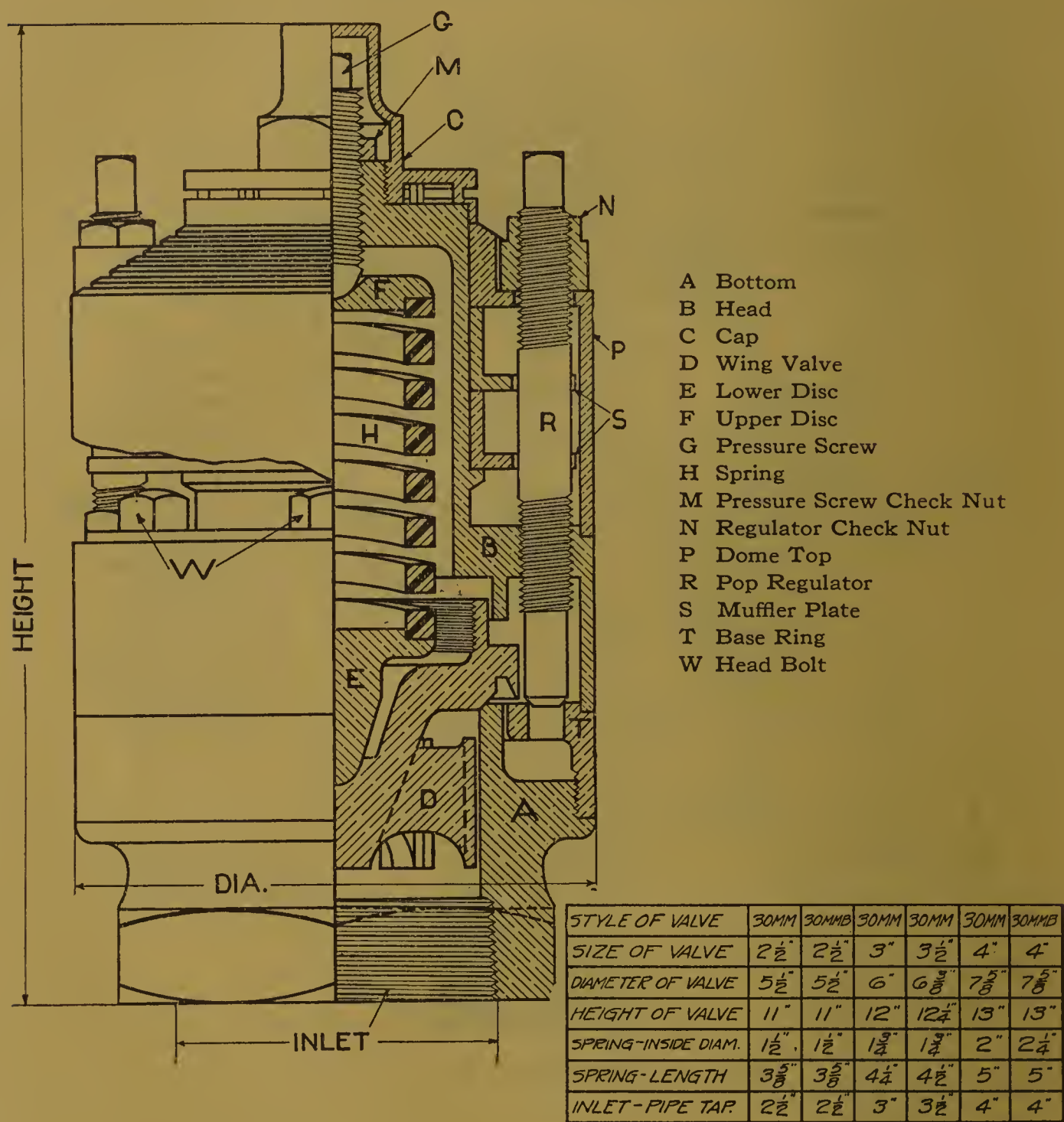
No. 30C Muffled Valve, similar to No. 30 Valve on page 18, excepting length of spring and style of wing valve. A special valve constructed to meet restricted height and clearance conditions.

Latest style valve has slots instead of drilled holes in cap and dome top.

	Page
List Prices of Parts	43
Illustration of Wing Valve	30
General Instructions	34, 35
Special Instructions	37

ASHTON MUFFLED POP SAFETY VALVES

STYLE No. 30 M. M. 3 AND 3½ INCH
No. 30 M. M. B. 2½ AND 4 INCH

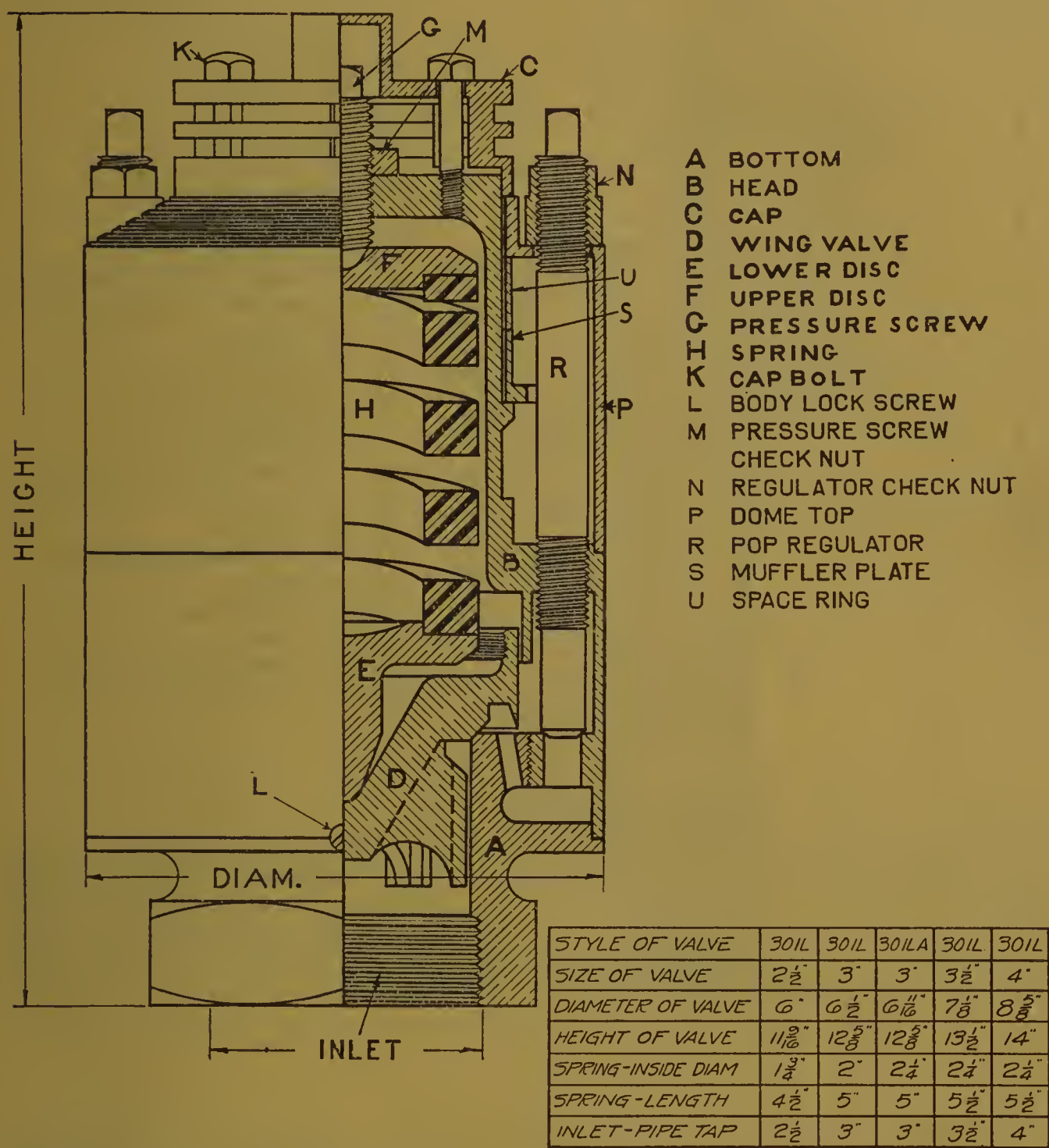


No. 30 M. M. and 30 M. M. B. (Master Mechanics) Muffled Valves, with outside pop regulators, bolted body type, connection standard pipe thread, same size as valve. Springs, spring discs, caps, wing valves, pressure screws, and lock nuts interchange with No. 28 M. M. and 28 M. M. B. Open Pop. Designed in accordance with recommended practice of the Committee on Safety Valves of the American Railway Master Mechanics Association, 1912. See description of design No. 28 M. M. and 28 M. M. B. Open Pop on page 14, in connection with which they are generally used. After a thorough service test, we are in a position to recommend them to our patrons.

List Prices of Parts	Page 42	Special Instructions	Page 37
Illustrations of Wing Valves	31	Capacity Chart	28, 29
General Instructions	34, 35	Discharge Capacity	27

ASHTON MUFFLED POP SAFETY VALVES

STYLE No. 30 I. L.
No. 30 I. L. A. 3 INCH

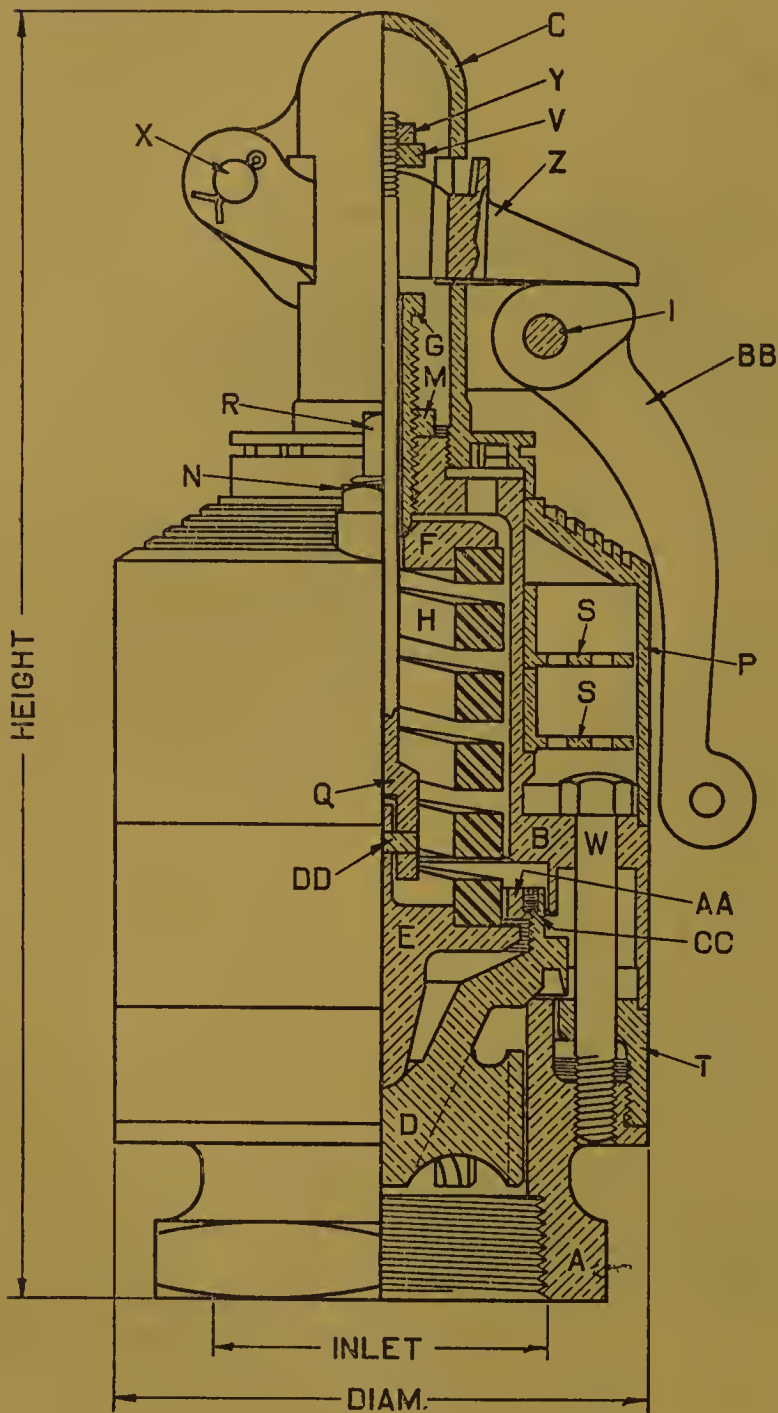


No. 30 I. L. and 30 I. L. A. (Increased Lift) Muffled Valves, with outside pop regulators, screwed body type. Unless otherwise specified, furnished with standard pipe thread connections same size as valve. Similar in design to the No. 30 Valve, but heavier in construction throughout to withstand the severe service imposed by the increased capacity. Wing valves, springs, spring discs, pressure screws, and lock nuts interchange with the No. 28 I. L. and 28 I. L. A. Open Pop, with which this style valve is used. For further information on design refer to description of this valve on page 15.

	Page		Page
List Prices of Parts	42	Special Instructions	39
Illustrations of Wing Valves	31	Capacity Chart	28, 29
General Instructions	34, 35	Discharge Capacity	27

ASHTON MUFFLED POP SAFETY VALVES

STYLE No. 30 M. M. A.



- A Bottom
- B Head
- *C Cap
- D Wing Valve
- *E Lower Disc
- *F Upper Disc
- *G Pressure Screw
- H Spring
- *I Lever Pin
- M Pressure Screw Check Nut
- N Regulator Check Nut
- P Dome Top
- *Q Spindle
- R Pop Regulator
- S Muffler Plate
- T Base Ring
- *V Lower Spindle Check Nut
- W Heat Bolt
- *X Fork Pin
- *Y Upper Spindle Check Nut
- *Z Fork
- *AA Valve Ring
- *BB Lever
- *CC Valve Ring Lock Screw
- *DD Spindle Pin

SIZE OF VALVE	2½"	3"	3½"
DIAMETER OF VALVE	5½"	6"	6¾"
HEIGHT OF VALVE	13¾"	15¼"	15¾"
SPRING-INSIDE DIAM.	1½"	1¾"	1¾"
SPRING-LENGTH	3½"	4½"	4½"
INLET-PIPE TAP	2½"	3"	3½"

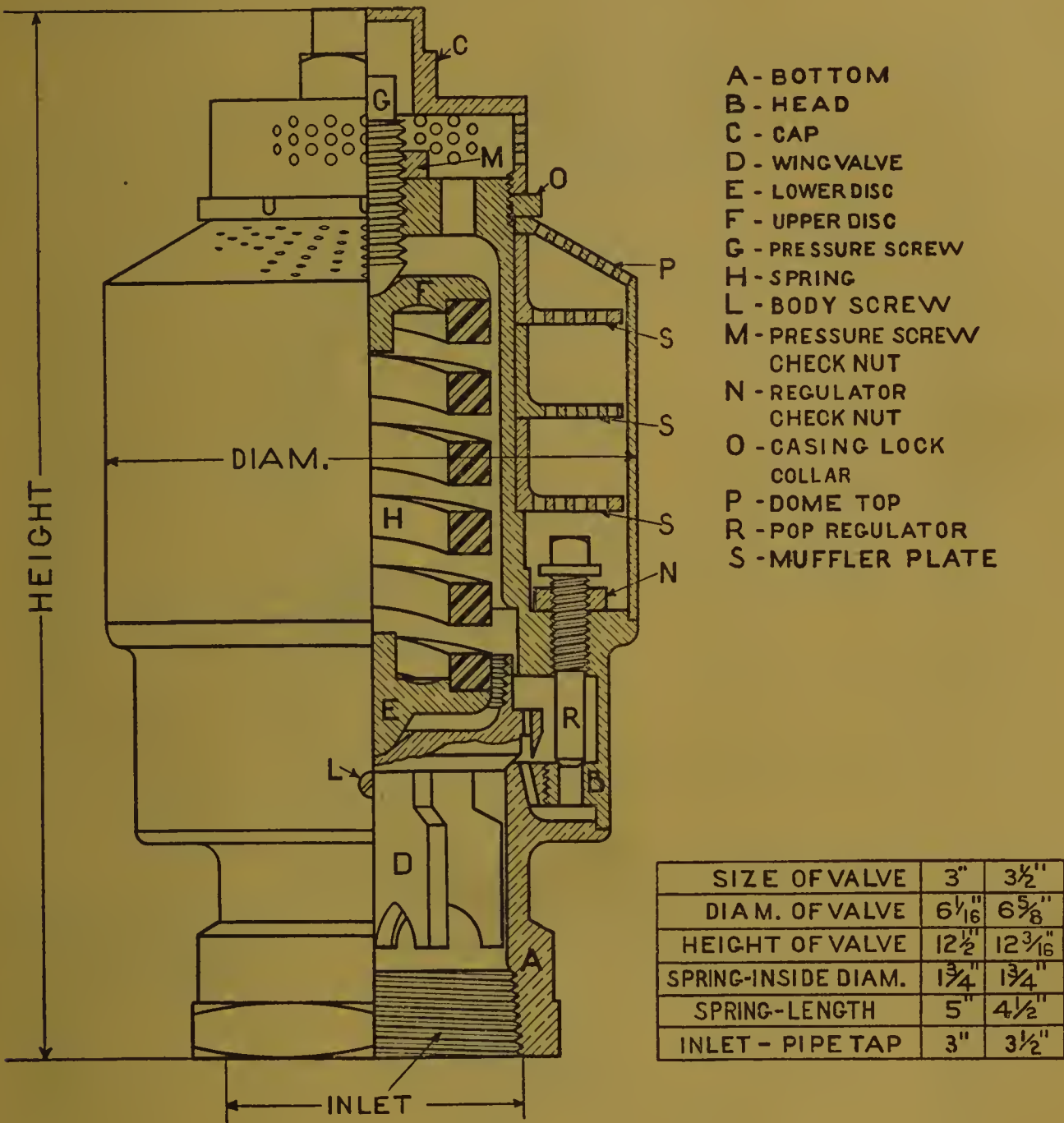
No. 30 M. M. A. Muffled Valve, Cam Lever, with outside pop regulators, bolted body type. For a more complete explanation of the original purpose in designing this valve see description of the No. 28 M. M. A. style, as given on page 16.

	Page
Illustrations of Wing Valves	31
General Instructions	34, 35
Special Instructions	37
Capacity Chart	28, 29

*List prices of cam lever and attachments on application. Other parts same as 30 M. M.

ASHTON MUFFLED POP SAFETY VALVES

STYLE No. 30B



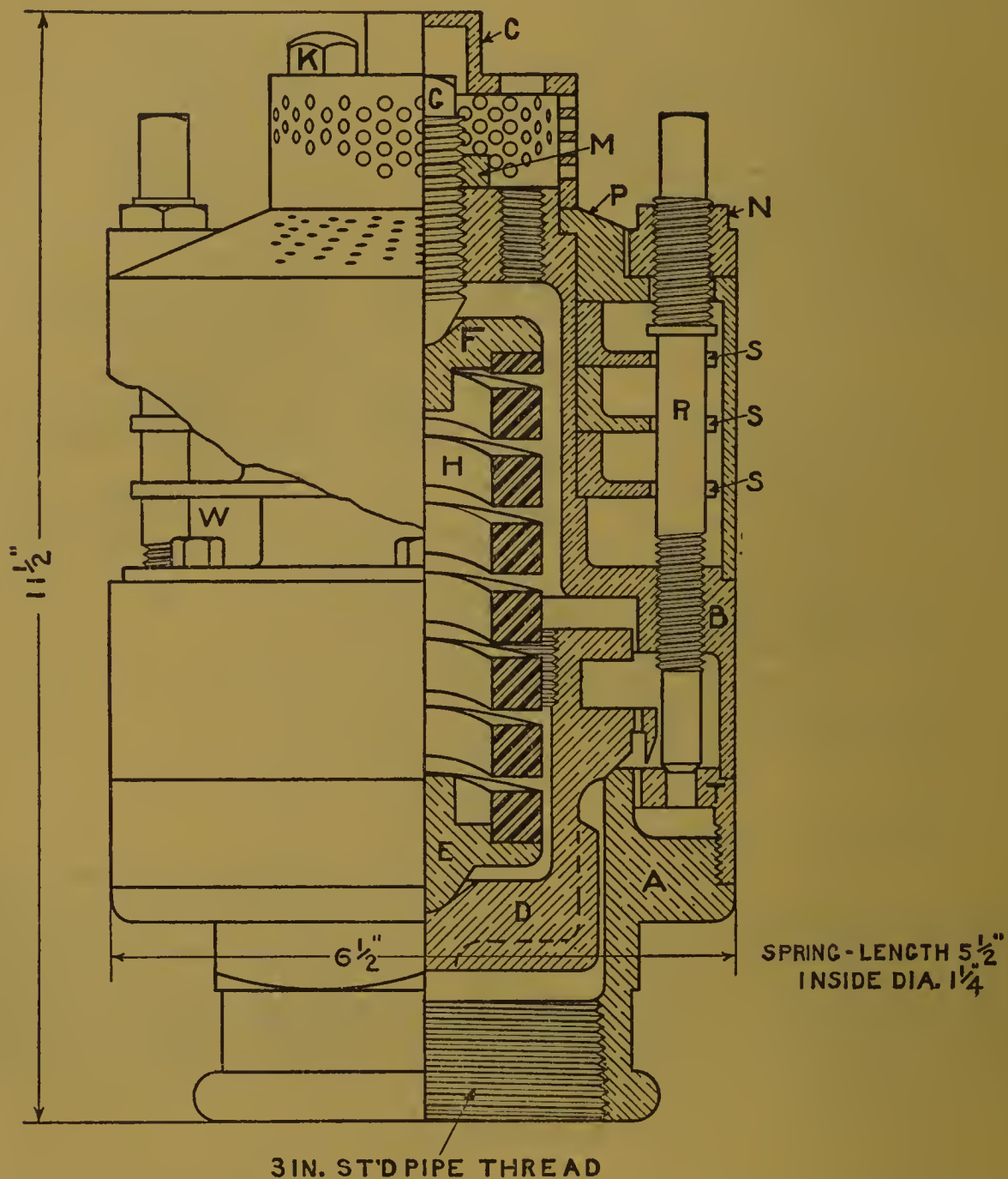
No. 30B Muffled Valve, with inside pop regulators, screwed body type, standard pipe thread connections same size as valve. Similar in design to the No. 30, with exceptions as noted. The pop regulators are on the inside to prevent inexperienced men tampering with the regulation. The dome, cap, and baffle plates can be removed without changing any of the adjustments, and the valve so operated as an Open Pop, if desired. The large expansion chambers in this valve give it a capacity slightly in excess of the No. 30, and it is, as a rule, used in connection with the No. 28B Open Pop, shown on page 13.

Latest style valve has slots instead of drilled holes in cap and dome top.

List Prices of Parts	Page 43
Illustrations of Wing Valves	30, 31
General Instructions	34, 35
Special Instructions	39

ASHTON MUFFLED POP SAFETY VALVES

STYLE No. 30D. SIZE, 3½ INCHES



No. 30D Muffled Valve, old style, with pop regulators, bolted body type, wing valve drop centre design. See description 26C Valve on page 7.

	Page
List Prices of Parts	43
List of Parts	25
Illustration of Wing Valve	30
General Instructions	34, 35
Special Instructions	37

DISCHARGE CAPACITY IN POUNDS PER
HOUR OF ASHTON LOCOMOTIVE
SAFETY VALVES

No. 28 M. M., No. 28 M. M. B., No. 30 M. M., No. 30 M. M. B.

Pressure Lbs. per Square Inch Gage	SIZE, INCHES			
	2½	3	3½	4
150	4,650	5,550	6,500	7,450
160	4,950	5,900	6,900	7,900
170	5,250	6,250	7,300	8,350
180	5,500	6,600	7,700	8,800
190	5,800	6,950	8,100	9,250
200	6,100	7,300	8,500	9,700
210	6,350	7,600	8,900	10,150
220	6,650	7,900	9,300	10,600
230	6,950	8,250	9,700	11,050
240	7,250	8,600	10,100	11,500
250	7,500	8,950	10,500	11,950
260	7,800	9,300	10,900	12,400
270	8,100	9,650	11,300	12,850
280	8,400	10,000	11,700	13,300
290	8,700	10,300	12,100	13,750
300	9,000	10,650	12,500	14,200

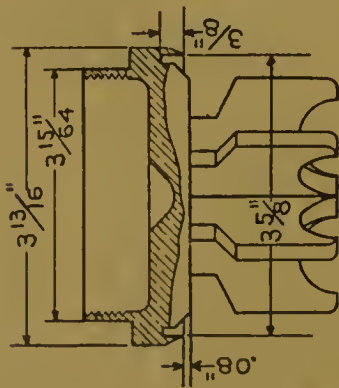
No. 28 I. L., No. 28 I. L. A., No. 30 I. L., No. 30 I. L. A.

Pressure Lbs. per Square Inch Gage	SIZE, INCHES			
	2½	3	3½	4
150	5,170	6,770	7,900	8,280
160	5,490	7,180	8,380	8,780
170	5,800	7,600	8,860	9,280
180	6,120	8,010	9,340	9,790
190	6,430	8,420	9,820	10,290
200	6,740	8,830	10,300	10,790
210	7,060	9,240	10,780	11,290
220	7,370	9,650	11,260	11,800
230	7,690	10,060	11,740	12,300
240	8,000	10,470	12,220	12,800
250	8,310	10,880	12,700	13,300
260	8,630	11,300	13,180	13,810
270	8,940	11,710	13,660	14,310
280	9,260	12,120	14,140	14,810
290	9,570	12,530	14,620	15,310
300	9,890	12,940	15,100	15,820

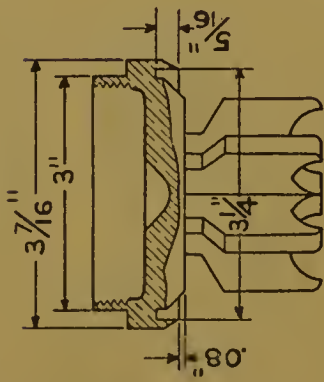
We are prepared to furnish valves for higher pressures if required.

Total heating surface Sq. Ft.	POUNDS PER SQUARE INCH												Total heating surface Sq. Ft.		
	240		250		260		270		280		290			300	
	No.	Size	No.	Size	No.	Size	No.	Size	No.	Size	No.	Size	No.	Size	
1550	These recommendations are based on the Heating Surface, Pressure and Master Mechanic's 1912 Formula and are for Coal Fired boilers of ordinary proportions.														1550
1650															1650
1750															1750
1850	For Oil Fired boilers or those having extra large grate area and fire boxes or special devices for giving greater evaporation, we advise the use of the next larger size or an additional valve if of the M. M. or M. M. B. type or follow this chart using the I. L. or I. L. A. valves which have 10 to 25 per cent greater capacity than the M. M. and M. M. B. types.														1850
1950															1950
2050															2050
2150															2150
2250	Two 2½-inch valves for all combinations above heavy lines; based on the law requiring two valves and the smallest size considered good practice for locomotive service.														2250
2350															2350
2450															2450
2550	Any combination of these valves may be used for another if the product of the new combination equals or exceeds that replaced.														2550
2650	e.g. 4-3" = 12" for 3-4" = 12"														2650
2750	or 3-3" = 9" for 2-4" = 8"														2750
2850	2	2½													2850
3000	2	3	2	2½	2	2½									3000
3150	2	3	2	3	2	3	2	2½							3150
3300	2	3	2	3	2	3	2	3	2	2½					3300
3450	2	3	2	3	2	3	2	3	2	3	2	2½	2	2½	3450
3600	2	3½	2	3	2	3	2	3	2	3	2	3	2	3	3600
3750	2	3½	2	3½	2	3	2	3	2	3	2	3	2	3	3750
3900	2	3½	2	3½	2	3½	2	3	2	3	2	3	2	3	3900
4050	2	3½	2	3½	2	3½	2	3½	2	3	2	3	2	3	4050
4200	2	3½	2	3½	2	3½	2	3½	2	3½	2	3	2	3	4200
4350	3	3	2	3½	2	3½	2	3½	2	3½	2	3½	2	3	4350
4500	3	3	3	3	2	3½	2	3½	2	3½	2	3½	2	3½	4500
4650	3	3	3	3	3	3	2	3½	2	3½	2	3½	2	3½	4650
4800	3	3	3	3	3	3	3	3	2	3½	2	3½	2	3½	4800
4950	3	3	3	3	3	3	3	3	3	3	2	3½	2	3½	4950
5100	3	3	3	3	3	3	3	3	3	3	3	3	2	3½	5100
5250	3	3	3	3	3	3	3	3	3	3	3	3	3	3	5250
5400	3	3	3	3	3	3	3	3	3	3	3	3	3	3	5400
5550	3	3	3	3	3	3	3	3	3	3	3	3	3	3	5550
5700	3	3½	3	3	3	3	3	3	3	3	3	3	3	3	5700
5850	3	3½	3	3	3	3	3	3	3	3	3	3	3	3	5850
6000	3	3½	3	3½	3	3	3	3	3	3	3	3	3	3	6000
6250	3	3½	3	3½	3	3½	3	3	3	3	3	3	3	3	6250
6500	3	3½	3	3½	3	3½	3	3½	3	3	3	3	3	3	6500
6750	3	4	3	3½	3	3½	3	3½	3	3½	3	3	3	3	6750
7000	3	4	3	4	3	3½	3	3½	3	3½	3	3½	3	3½	7000
7250	3	4	3	4	3	4	3	3½	3	3½	3	3½	3	3½	7250
7500	3	4	3	4	3	4	3	4	3	3½	3	3½	3	3½	7500
7750	4	3½	3	4	3	4	3	4	3	4	3	3½	3	3½	7750
8000	4	3½	4	3½	3	4	3	4	3	4	3	4	3	3½	8000

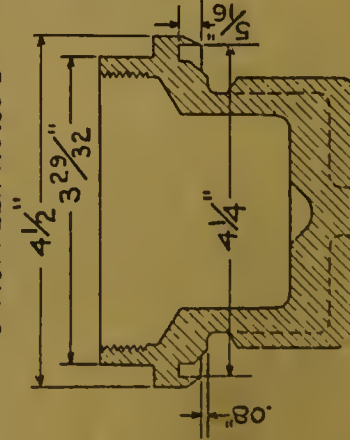
WING VALVES



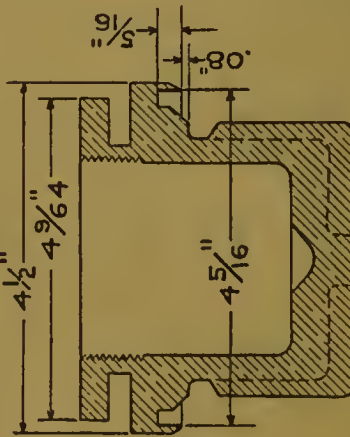
HIGH CENTER
3" OPEN POP NO. 28-B
3" MUFFLER NO. 30-B



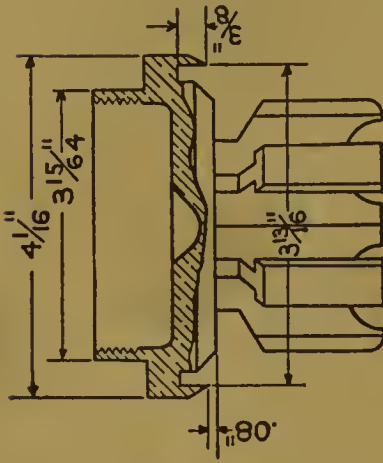
HIGH CENTER
2 1/2" MUFFLER NO. 30



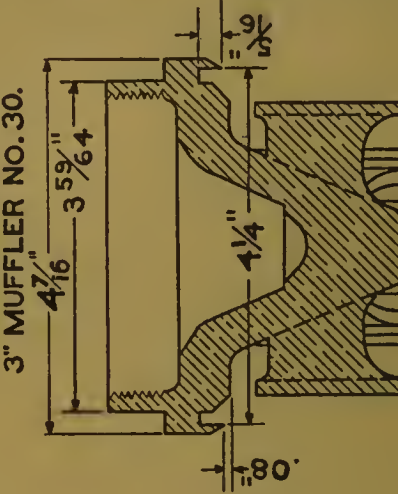
DROP CENTER NO. 26-C
3 1/2" OPEN POP OLD STYLE



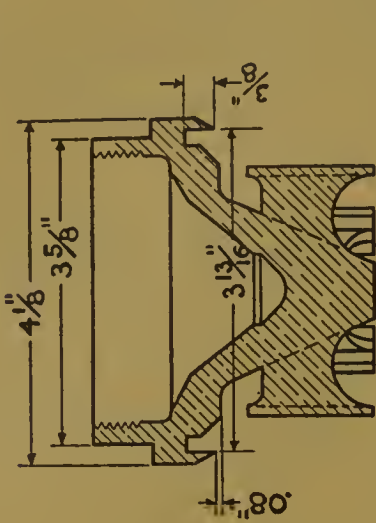
DROP CENTER
3 1/2" MUFFLER NO. 30-D



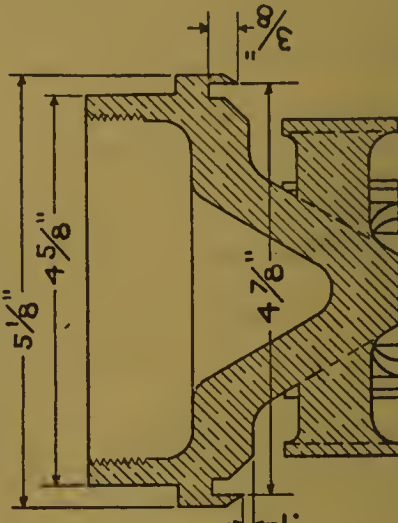
HIGH CENTER
3" OPEN POP NO. 28
3" MUFFLER NO. 30.



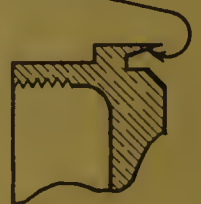
LOW CENTER
3 1/2" OPEN POP NO. 28-28A
3 1/2" MUFFLER NO. 30



LOW CENTER
3" MUFFLER NO. 30C

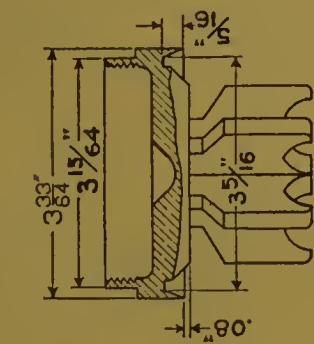


LOW CENTER
4" OPEN POP NO. 28
4" MUFFLER NO. 30



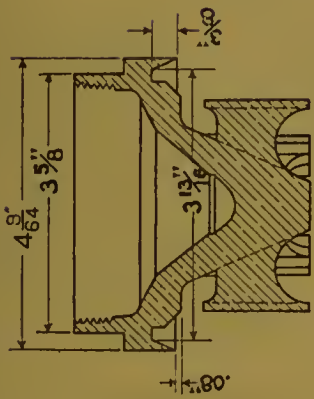
ALL STYLES
WING VALVES NOW MADE WITH BEVEL
ON INSIDE OF LIP

WING VALVES



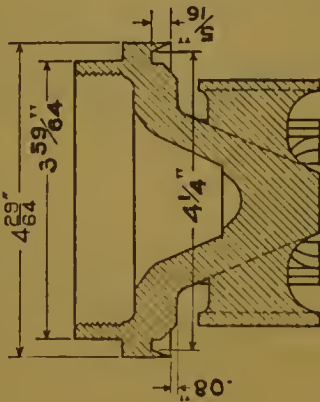
HIGH CENTER

- 2 1/2" OPEN POP NO. 28 M.M.
- 2 1/2" MUFFLER NO. 30 M.M.
- 2 1/2" OPEN POP NO. 28
- 2 1/2" OPEN POP NO. 28 M.M.B.
- 2 1/2" MUFFLER NO. 30 M.M.B.



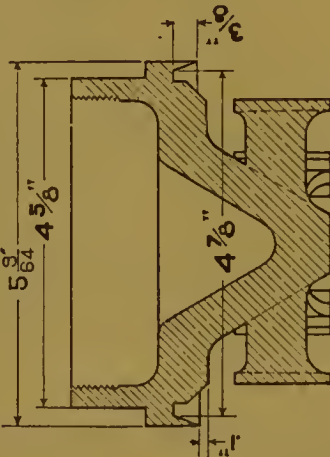
LOW CENTER

- 3" OPEN POP NO. 28 M.M.
- 3" MUFFLER NO. 30 M.M.



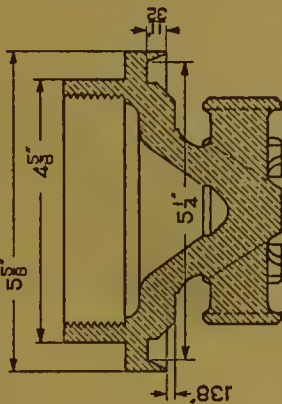
LOW CENTER

- 3 1/2" OPEN POP NO. 28 M.M. & 28 B.
- 3 1/2" MUFFLER NO. 30 M.M. & 30 B.



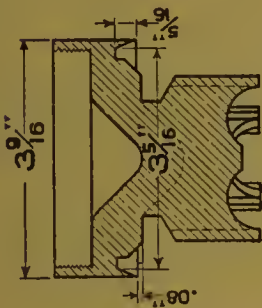
LOW CENTER

- 4" OPEN POP NO. 28 M.M.
- 4" MUFFLER NO. 30 M.M.



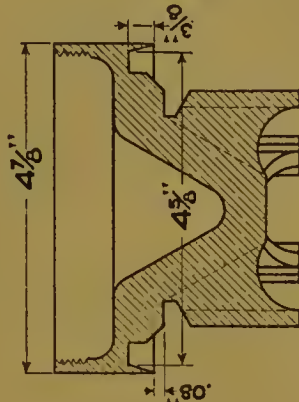
LOW CENTER

- 4" OPEN POP NO. 28 M.M.B.
- 4" MUFFLER NO. 30 M.M.B.



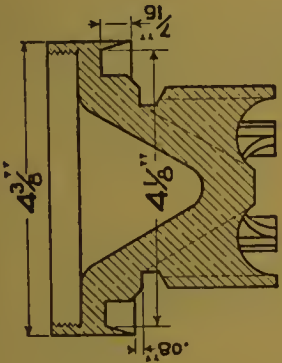
LOW CENTER

- 2 1/2" OPEN POP NO. 28 I.L.
- 2 1/2" MUFFLER NO. 30 I.L.



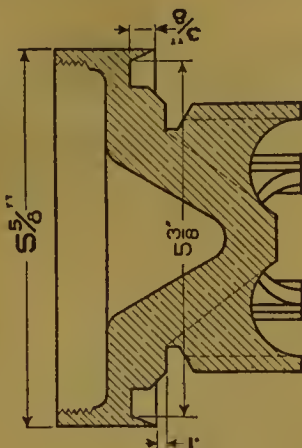
LOW CENTER

- 3 1/2" OPEN POP NO. 28 I.L.
- 3 1/2" MUFFLER NO. 30 I.L.



LOW CENTER

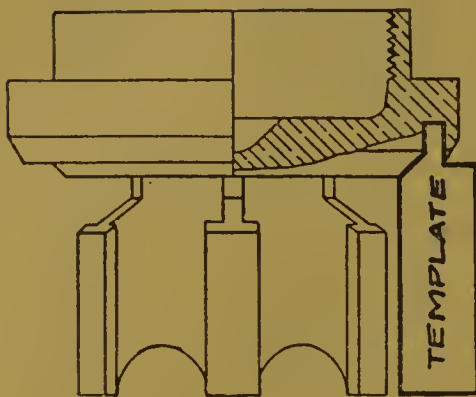
- 3" OPEN POP NO. 28 I.L.
- 3" MUFFLER NO. 30 I.L.
- 3" OPEN POP NO. 28 I.L.A.
- 3" MUFFLER NO. 30 I.L.A.



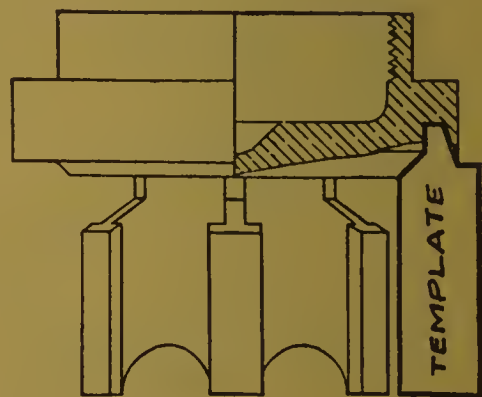
LOW CENTER

- 4" OPEN POP NO. 28 I.L.
- 4" MUFFLER NO. 30 I.L.

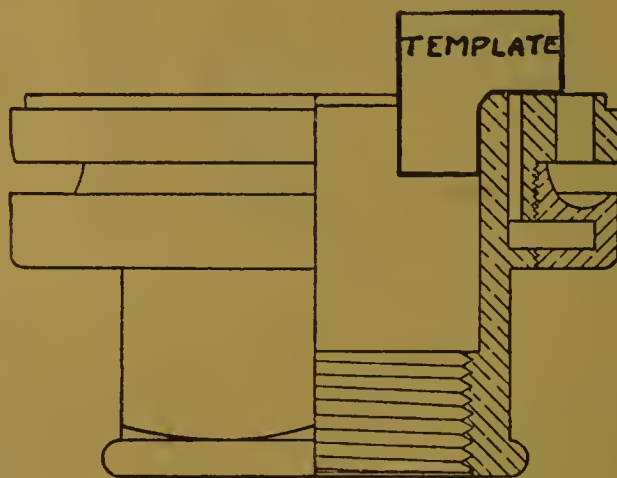
WING VALVES AND SEAT SHOWING TEMPLATES FITTED



OLD STYLE WITH LIP BEVELLED
ON OUTSIDE



NEW STYLE WITH LIP BEVELLED
ON INSIDE

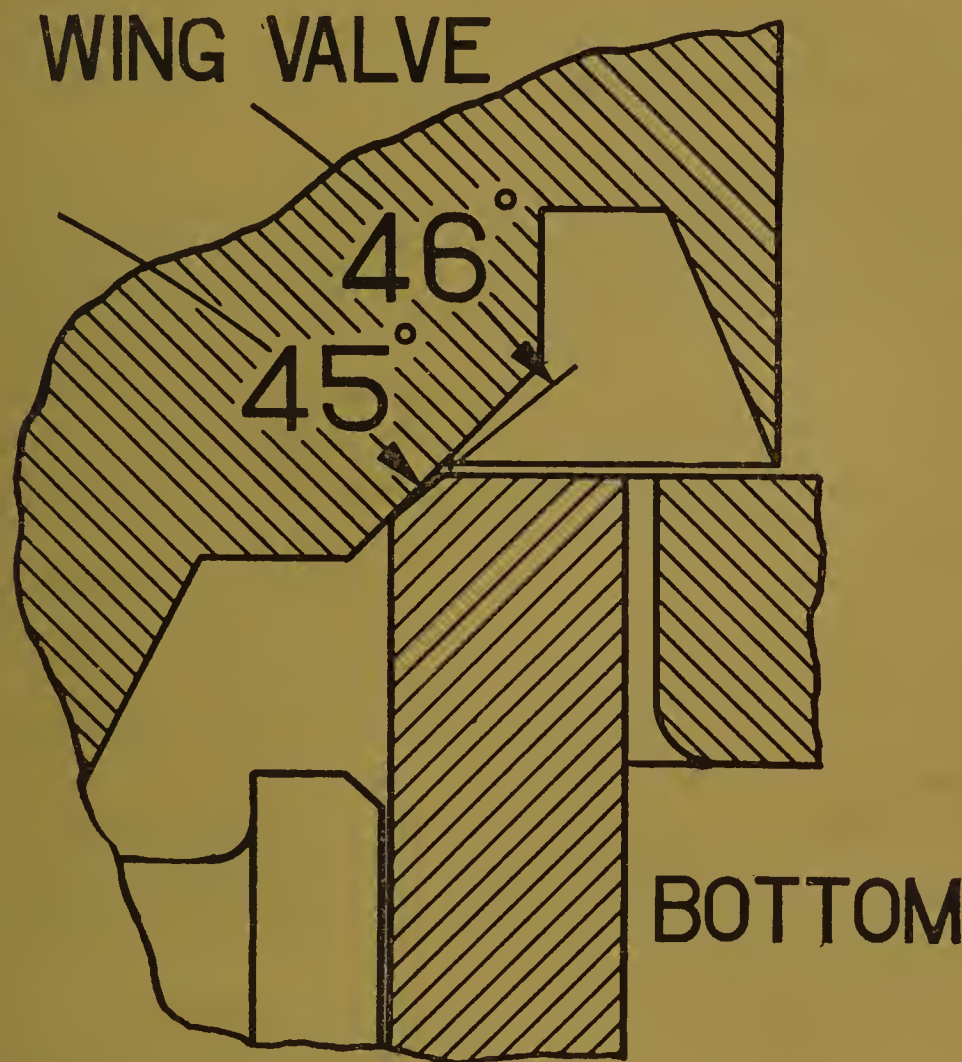


SEAT SHOWING 46° BEVEL

To railroads using our valves as standard, we furnish gratis, one set of master templates from which such additional templates as may be required, should be made.

To others we make a nominal charge of \$1.50 each net.

SECTION OF WING VALVE AND BOTTOM
SHOWING PROPER RELATION OF
WING VALVE AND SEAT



The cut shows the 46° angle of seat and 45° angle of wing valve, both measured from a vertical line. The difference of 1° gives the heavy bearing on the inside edge as mentioned at bottom of page 34.

These angles are the same as they always have been, but heretofore the printed information has not called attention to the difference between seat and wing valve, referring to them in a general way as the “45° seat.”

GENERAL INSTRUCTIONS
FOR REPAIRS, SETTING AND REGULATING
ASHTON POP SAFETY VALVES

	Page
General Instructions	34, 35
Special Instructions on Bolted Type Valves	37
Special Instructions on Screwed Type Valves	39
General Information	4

GENERAL INSTRUCTIONS

Applying to Ashton Locomotive Muffled and Open Pop Safety Valves

To change "pop," slack check nut on one or both of the pop regulators, and screw down for increased "pop" or up for less "pop."

Never change set pressure of a safety valve until gage has been tested and found correct.

To change set pressure remove top cap if any, slack check nut, turn pressure screw down for higher or up for lower pressure, set up check nut. For pressures 215 pounds or less, no change should be made exceeding 15 pounds above or below that stamped on the spring. For higher pressures, 20 pounds variation is allowable. When variation exceeds above limits, new springs should be ordered.

Valves must be repaired in such a manner as to retain original lines. When necessary to turn seats or wing valves, do this to template. See page 32 for templates.

Valve seats, 46 degree, $\frac{3}{32}$ inch wide; 4 inch, $\frac{1}{8}$ inch wide.

Valve bottom should not be bored out. This practice increases the diameter of the valve, overloads the spring, and decreases the extended area of the lip on wing valve, which will prevent the valve popping as it should.

If wing valve is loose in bottom, wings should be peined out, then turned up true with 45 degree face. Allow .010 inch maximum clearance on diameter for expansion. See page 33 for section of wing valve and bottom, showing angles.

If necessary to reseat wing valve be sure that lower beveled edge does not extend more than $\frac{1}{16}$ inch below the inside edge of seat. Otherwise the pop will be affected and free discharge of steam obstructed.

If necessary to machine seat on valve bottom, take cut straight across upper end and same amount off recess into which head fits. If this practice is not followed the repairing will eventually lower the wing valve below the top sleeve, which may prevent valve opening.

Before facing off seat on valve bottom, care should be taken to see that bottom is trued up with diameter and length of bore, not with face of valve seat.

Special fixture and directions for use in these operations are shown on pages 40 and 41.

Do not turn off $\frac{1}{16}$ inch if $\frac{1}{64}$ inch will answer the purpose. Frequently the service of valves is shortened years by excess cuts.

Extended lip on wing valve must be within approximately .010 inch of face of valve seat to obtain pop regulation and good results. Wing valve must rest solidly on the bevel seat *and slightly heavy on inside edge*; if properly machined, no grinding is necessary but any irregularities should be rubbed out with oil between seats. No grinding compound should be used. The knife-edge lip must never touch, otherwise the valve will leak. It is customary to fit the valve when new so that it can be slightly rocked by hand. See cut page 33.

After valve is repaired assemble without spring and see that the wing valve can be moved freely from its seat $\frac{3}{16}$ inch or more, and that the wings do not extend below pipe thread, or strike the shoulder at end of thread where valve screws on to nipple.

Use graphite on bolts and pivot points of spring discs, also on dome nipple.

Springs showing a deflection of $\frac{3}{8}$ inch or more from original length, or out of line $\frac{1}{8}$ inch when measured parallel with the length, should be discarded.

Thoroughly clean out the turret or dome on boiler with air or water pressure before valves are applied, to prevent chips or foreign substances working into the valves.

Strong pop or blow-back is essential to efficiency. If valves are properly repaired pop regulators will control blow-back 0 to 10 pounds; they are effective from a closed position for full pop to an elevation equal to their diameter for no pop.

Example for setting safety valves, locomotive boiler equipped with three valves, pressure 200 pounds.

VALVE	SET	POP	CLOSE
3d	204	6	198
2d	202	5	197
1st	200	4	196

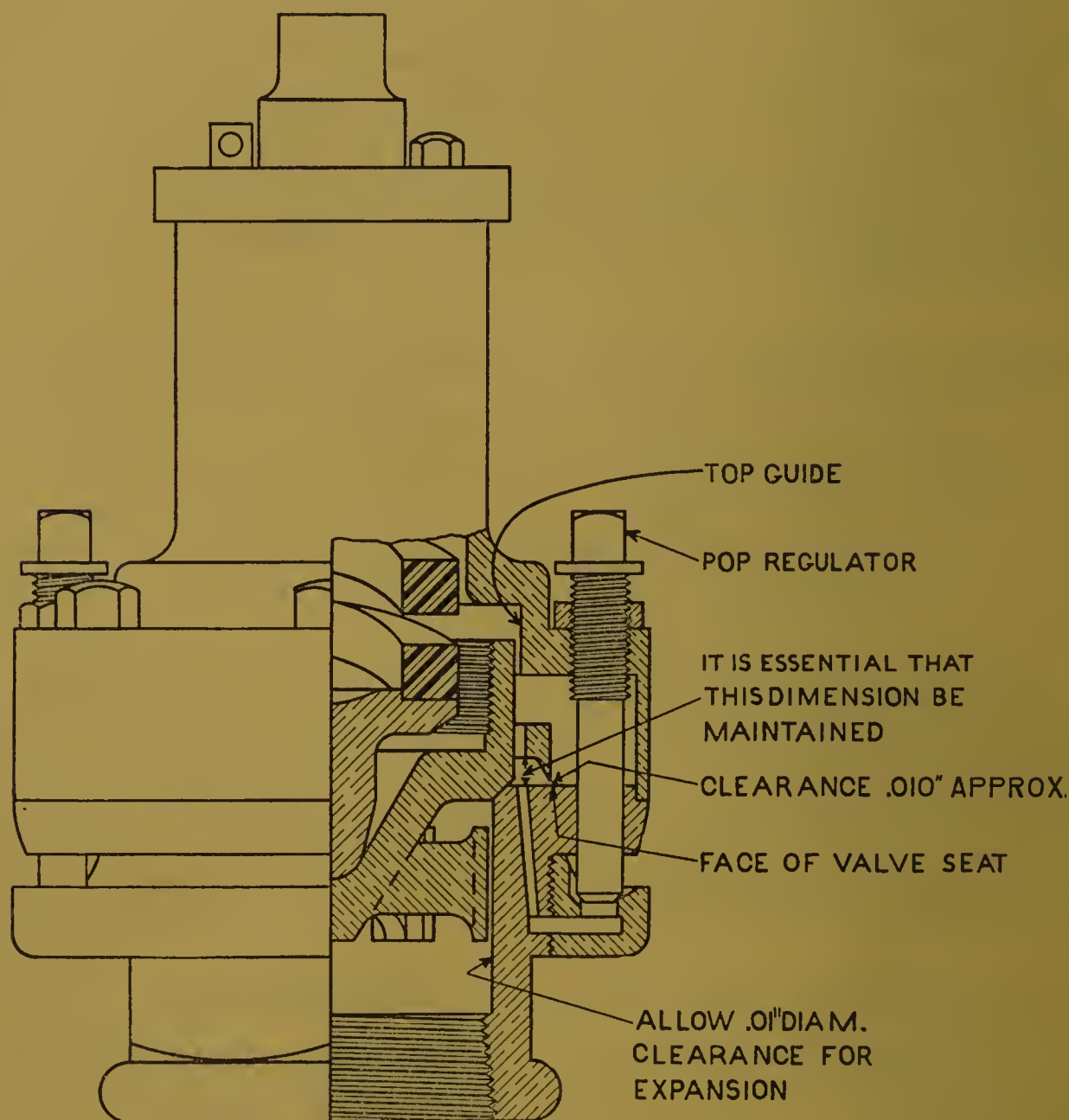
Always set pressure and regulate blow-back on high valve first. Locomotives equipped with two valves use same formula. After setting valves at required pressure and when adjusting blow-back, should valve then open a pound or two light, do not change the pressure adjustment; the flow of steam due to the repeated opening of the valve heats up the body and spring, and may cause a slight reduction in set pressure that will not occur in regular service.

PLEASE NOTE FOLLOWING SUGGESTIONS

Our Pop Safety Valves are set at our works under steam to the requires pressure; but if, after being in use a few days, they should blow off at a slightly lower pressure (as is likely to be the case with any new valve), please see that the pressure is set back promptly to the original pressure again. If allowed to run light it causes the valve to remain on a balance and hammer to its injury. When adjusted in this way once or twice, as needed, the valve will run for months without further readjustment.

	Page
Illustrations of Instructions	36, 38
Special Instructions Bolted Type Valves	37
Special Instructions Screwed Type Valves	39
General Information on Safety Valves	4

ILLUSTRATION OF INSTRUCTIONS
FOR ASHTON OPEN POP AND MUFFLED
SAFETY VALVES, BOLTED TYPE



(For Instructions see opposite page)

SPECIAL INSTRUCTIONS FOR REPAIRING BOLTED TYPE ASHTON SAFETY VALVES

(Illustration shown on opposite page)

The following instructions apply to both Muffled and Open Pop Safety Valves: Valves must be repaired in such manner as to retain original lines. When necessary to turn seats or wing valves do this to template.

See cuts of wing valves, pages 30 and 31, and for templates, page 32.

Valve seats, 46° , $\frac{3}{32}$ inch wide; 4 inch, $\frac{1}{8}$ inch wide.

If necessary to machine seat on valve bottom "A," take cut straight across face of valve seat and same amount off recess into which head fits. If this practice is not followed the repairing will eventually lower the wing valve below the top sleeve guide, which may prevent valve opening.

Do not turn off $\frac{1}{16}$ inch if $\frac{1}{64}$ inch will answer the purpose. Frequently the service of valves is shortened years by excess cuts.

Extended lip on wing valve must be within approximately .010 inch of face of valve seat to obtain pop regulation and good results.

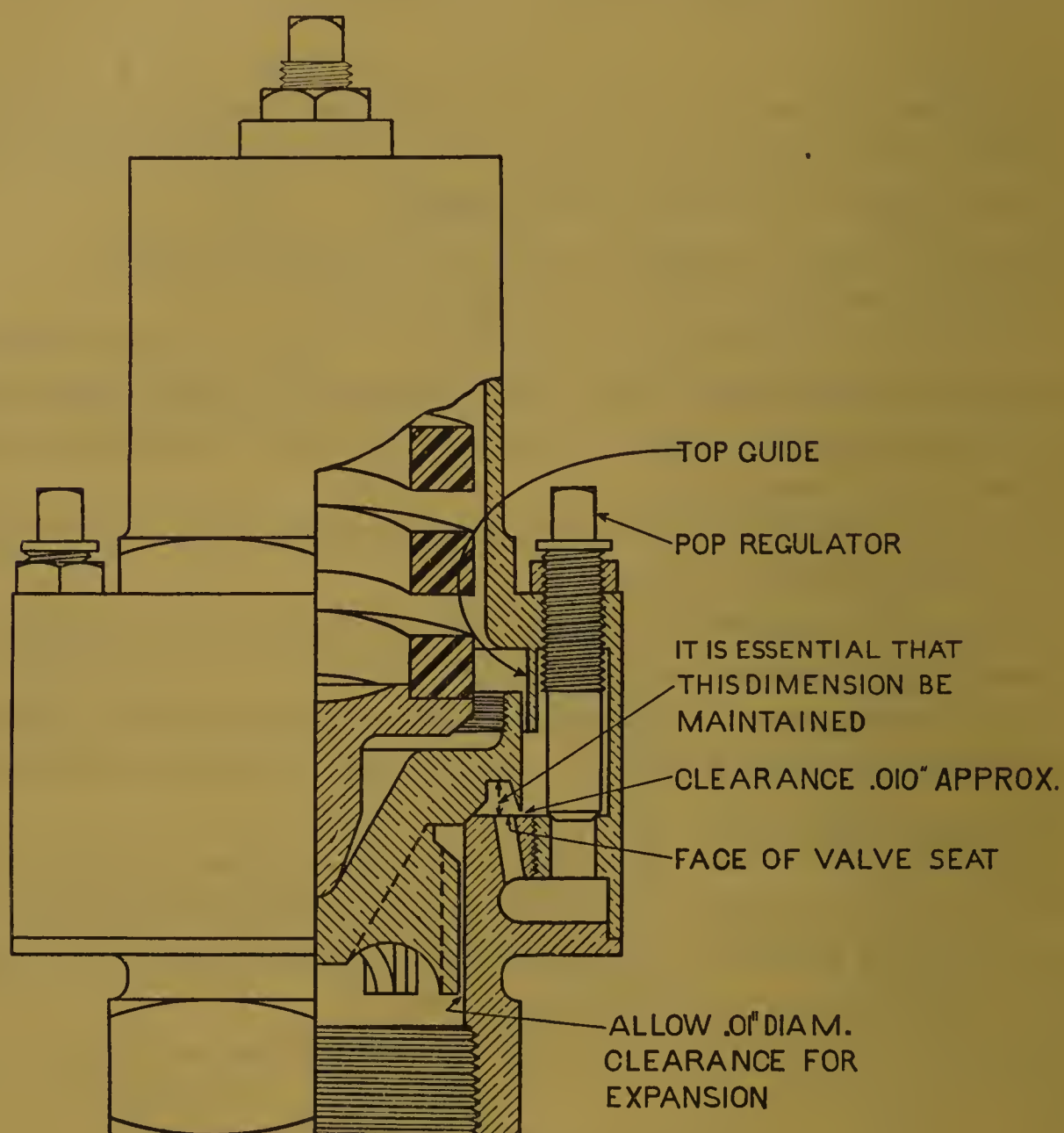
After valve is repaired assemble without spring and see that the wing valve can be moved freely from its seat $\frac{3}{16}$ inch or more, and that the wings do not strike the shoulder at end of thread where valve screws on to nipple.

Use graphite on threads of body bolts in assembling valves. To loosen bolts, which have become corroded due to long service, and prevent them from twisting off, the top and sides of heads of the bolts should be given sharp blows with a light weight hammer, after which they can be readily unscrewed.

Graphite should also be used on pivot points of spring discs, as well as on dome nipple.

(For General Instructions see pages 34 and 35)

ILLUSTRATION OF INSTRUCTIONS
FOR ASHTON OPEN POP AND MUFFLED
SAFETY VALVES, SCREWED TYPE



(For Instructions see opposite page)

SPECIAL INSTRUCTIONS FOR REPAIRING SCREWED BODY TYPE ASHTON SAFETY VALVES

(Illustration shown on opposite page)

The following instructions apply to both Muffled and Open Pop Safety Valves:

Valves must be repaired in such manner as to retain original lines. When necessary to turn seats or wing valves do this work to template.

See cuts of wing valves, pages 30 and 31, and for templates, page 32.

Valve seats, 46° , $\frac{3}{32}$ inch wide; 4 inch, $\frac{1}{8}$ inch wide.

If necessary to machine seat on valve body take cut straight across face of valve seat and same amount off inside of head.

Care should be observed that the repeated turning off metal from seat on wing valves and seat on bottom "A" does not lower the wing valve below the top sleeve guide, which may prevent valve opening.

Do not turn off $\frac{1}{16}$ inch if $\frac{1}{64}$ inch will answer the purpose. Frequently the service of valves is shortened years by excess cuts.

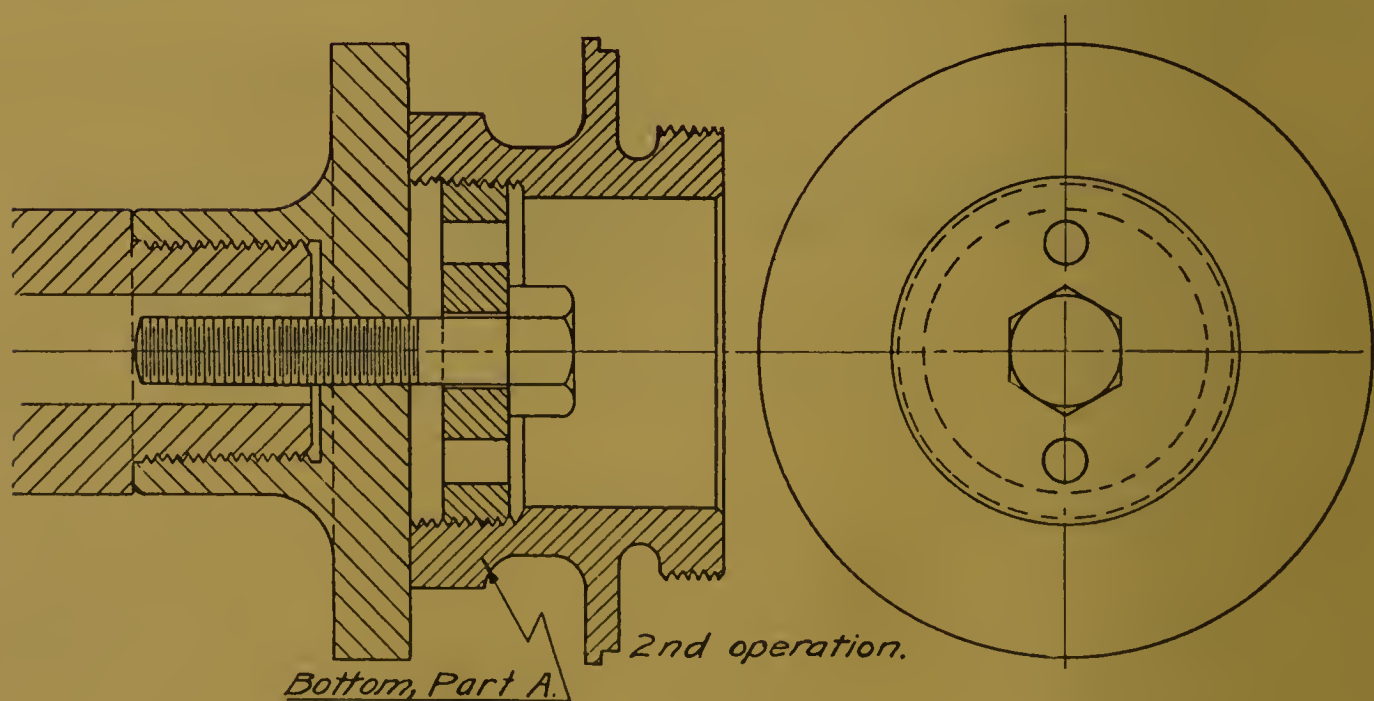
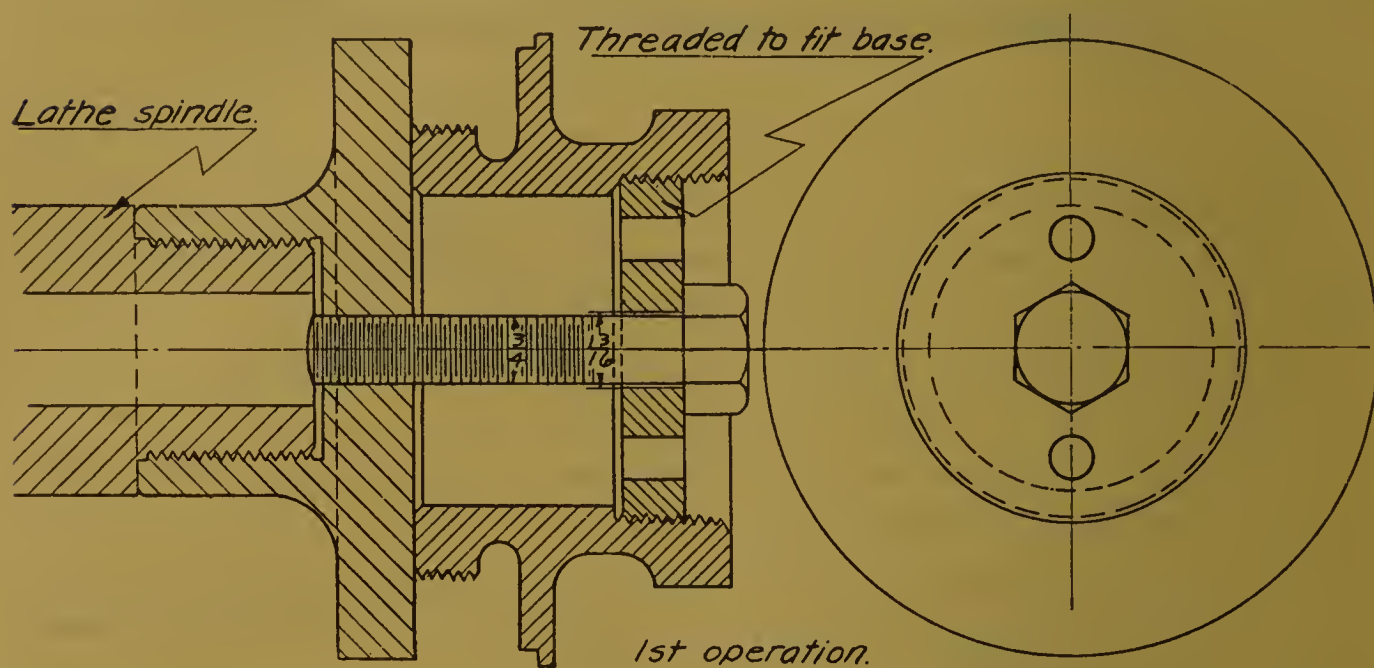
Extended lip on wing valve must be within approximately .010 inch of face of valve seat to obtain pop regulation and good results.

After valve is repaired assemble without spring and see that the wing valve can be moved freely from its seat $\frac{3}{16}$ inch or more, and that the wings do not extend below pipe thread.

Use graphite on threads where valve is screwed together, on pivot points of spring discs, and dome nipple.

(For General Instructions see pages 34 and 35)

SAFETY VALVE LATHE FIXTURE



Directions for use on opposite page.

SUGGESTIONS FOR THE USE OF SAFETY VALVE LATHE FIXTURE

The lathe fixture shown on the opposite page consists of a lathe face plate tapped in the center for $\frac{3}{4}$ " bolt, a $\frac{3}{4}$ " bolt of sufficient length to go through any size safety valve bottom, and a disc to screw in the bottom of the safety valve, one disc being required for each size of valve.

The center hole through the disc should be $\frac{13}{16}$ " or larger to permit the valve bottom assembly being centralized on the face plate.

The first operation is for the purpose of taking a light cut off the inlet end, making sure that the center hole does not wobble. Then reverse the assembly, as shown in the lower cut. In this position the valve bottom must be trued up to the center hole, a cut taken across the face, and the 46° seat machined. See page 33.

It is not absolutely necessary to carry out the first operation; however, if this is done the valve will leave the bench with both ends and the hole through the center in perfect alignment, and if necessary to remove the valve at some outside point for repairs, the outside shop with inadequate machinery will have the advantage of a true bottom to work from.

This method is much quicker than trueing the valve in either the scroll or universal chuck, and is much better than the ordinary screw mandrel for the reason that it can be absolutely centered, which is not the case with the screw mandrel.

ASHTON LOCOMOTIVE SAFETY VALVES

List Prices of Parts

Name of Part	Letter	Style No.	SIZE, INCHES			
			2½	3	3½	4
Bottom	A	28IL-28ILA-30IL-30ILA	\$16.00	\$20.00	\$26.00	\$35.00
		28MM-30MM	22.00	28.00	37.00	45.00
		28MMB-30MMB				
Head	B	28IL-28ILA	20.00	26.00	37.00	51.50
		28MM-28MMB	16.00	19.00	20.00	31.00
		30IL-30ILA	23.00	27.00	37.00	51.50
		30MM-30MMB	16.00	18.00	20.00	33.00
Cap	C	28IL-28ILA-30IL-30ILA	3.50	4.00	4.50	4.50
		30MM-30MMB	3.00	4.00	4.00	4.50
*Wing Valve	D	28IL-28ILA-30IL-30ILA	8.50	10.00	13.00	16.00
		28MM-30MM	8.00	10.00	12.00	15.00
		28MMB-30MMB				
Lower Disc	E	28IL-28ILA-30IL-30ILA	1.60	2.00	2.60	2.80
		28MM-30MM	1.40	1.60	1.60	2.60
		28MMB-30MMB				
Upper Disc	F	28IL-28ILA-30IL-30ILA	1.20	1.50	2.00	2.50
		28MM-30MM	1.10	1.30	1.30	2.40
		28MMB-30MMB				
Pressure Screw	G	28IL-28ILA-30IL-30ILA	.70	.80	.90	1.30
		28MM-30MM	.70	.80	.90	1.30
		28MMB-30MMB				
Spring	H	28IL-28ILA-30IL-30ILA	5.50	6.00	7.00	8.50
		28MM-30MM	5.00	5.50	6.00	7.50
		28MMB-30MMB				
Cap Bolt	K	28IL-28ILA-30IL-30ILA	.10	.10	.10	.10
Lock Screw	L	28IL-28ILA-30IL-30ILA	.10	.10	.10	.10
Pressure Screw						
Check Nut	M	All Styles	.40	.40	.40	.40
Regulator Check Nut	N	All Styles	.40	.40	.40	.40
Dome Top	P	30IL	9.00	10.00	13.00	20.00
		30MM-30MMB	9.00	10.00	11.00	13.00
		28IL-28ILA	1.00	1.00	1.10	1.10
Pop Regulator	R	28MM-28MMB	1.00	1.10	1.20	1.50
		30IL-30ILA	1.30	1.30	1.40	1.40
		30MM-30MMB	1.30	1.40	1.50	1.70
Muffler Plate	S	30IL-30ILA	1.80	2.30	2.50	3.40
		30MM-30MMB	1.90	2.00	2.10	2.50
Base Ring	T	Furnished only as part of Bottom "A"				
Muffler Plate	U	30IL-30ILA	1.20	1.40	1.80	2.10
Space Ring		30MM-30MMB	1.00	1.00	1.10	1.40
Head Bolt	W	28MM-30MM	.20	.25	.25	.30
		28MMB-30MMB				

Subject to Discount

Three inch and 3½ inch No. 28 U. S. Standard Style Open Pop Locomotive Safety Valve parts take same list as No. 28MM style.

No. 28MMA and 30MMA parts are same as No. 28MM and 30MM except those starred on pages 16 and 24.

For Reference List of Parts see pages 14, 15, 16, 22, 23 and 24.

*When an equal number of wing valves and bottoms is furnished, it is our practice to fit them. When wing valves are furnished separately, the wings are left oversize for fitting to bottoms.

NOTE.—In ordering parts always specify letter, name of part, style and size valve and set pressure for springs.

LIST PRICES OF PARTS

Special and Old Style Valves

Superseding list page 6, Instruction Book No. 16, and pages 74 and 75, Catalogue No. 18

Name of Part	Letter	Style No.	SIZE, INCHES			
			2½	3	3½	4
Bottom	A	28-30	\$20.00	\$27.00	\$32.00	\$46.00
		28B-30B		19.00	25.00	
Head	B	28	16.00	19.00	25.00	32.00
		28B		26.00	34.00	
		30	16.00	18.00	22.00	26.00
		30B		20.00	26.00	
Cap	C	28-30	3.50	4.00	4.00	4.00
		28B-30B		4.50	4.50	
*Wing Valve	D	28-30	8.50	11.00	12.00	15.00
		28B-30B		11.00	13.00	
Lower Disc	E	28-30	1.00	1.60	1.60	2.40
		28B-30B		1.60	1.80	
Upper Disc	F	28-30	1.00	1.30	1.30	1.60
		28B-30B		1.40	1.50	
Pressure Screw	G	28-30	.70	.80	.90	1.00
		28B-30B		.80	.90	
Spring	H	28-30	5.00	5.50	6.00	7.00
		28B-30B		5.50	6.00	
Lock Staple	J	28	.50	.50	.50	.50
Cap Bolt	K	28-30	.10	.10	.10	.20
		28B		.10	.10	
Lock Screw	L	28B-30B		.10	.10	
Pressure Screw						
Check Nut	M	All Styles	.40	.40	.40	.40
Regulator						
Check Nut	N	All Styles	.40	.40	.40	.40
Casing Lock						
Collar	O	30B		1.80	1.80	
Dome Top	P	30	8.50	10.00	12.50	20.00
		30B		9.50	14.50	
		28	1.20	1.20	1.20	1.30
Pop Regulator	R	28B-30B		1.30	1.30	
		30	1.50	1.50	1.50	1.60
		30	1.70	2.10	2.20	3.10
Muffler Plate	S	30B		2.10	2.20	
Base Ring	T	Furnished only as part of Bottom "A"				
Muffler Plate	U	30	1.00	1.00	1.10	1.50
		30B		1.00	1.10	
Space Ring						
Shown on cuts						
as part S						
Head Bolt	W	28-30	.15	.15	.15	.30

Subject to Discount

- 2½" No. 26A parts take same list as 2½" No. 28 style
- 3" No. 26B parts take same list as 3" No. 28 style
- 3½" No. 26C parts take same list as 3½" No. 28 style
- 3½" No. 28A parts take same list as 3½" No. 28 style
- 3" No. 30C parts take same list as 3" No. 30 style
- 3½" No. 30D parts take same list as 3½" No. 30 style

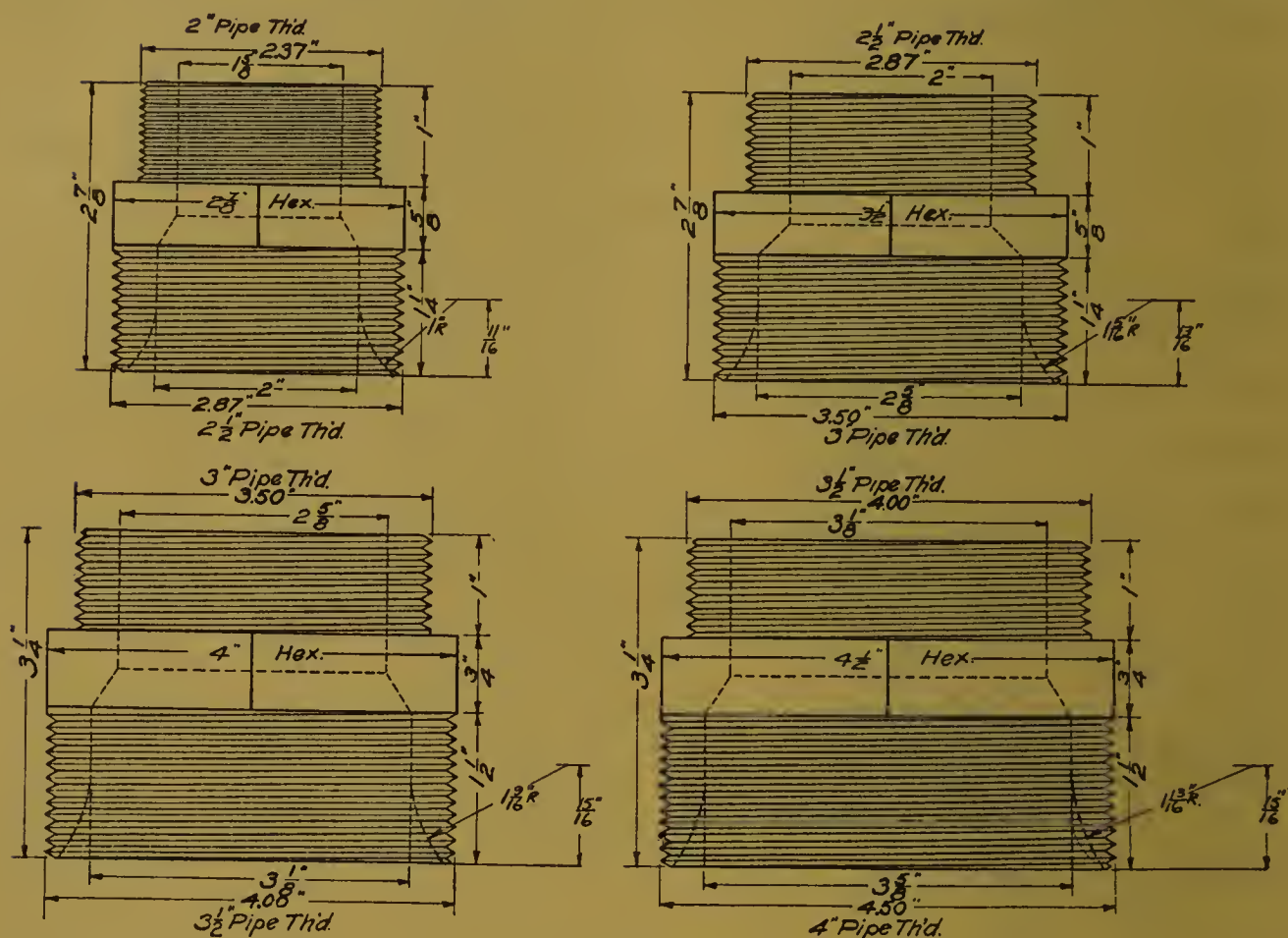
For Reference List of Parts see pages 7, 8, 13, 17, 21 and 25.

*When an equal number of wing valves and bottoms is furnished, it is our practice to fit them. When wing valves are furnished separately, the wings are left oversize for fitting to bottoms.

NOTE: In ordering parts always specify letter, name of part, style and size valve and set pressure for springs.

SAFETY VALVE DOME CONNECTIONS OR NIPPLES

RECOMMENDED PRACTICE



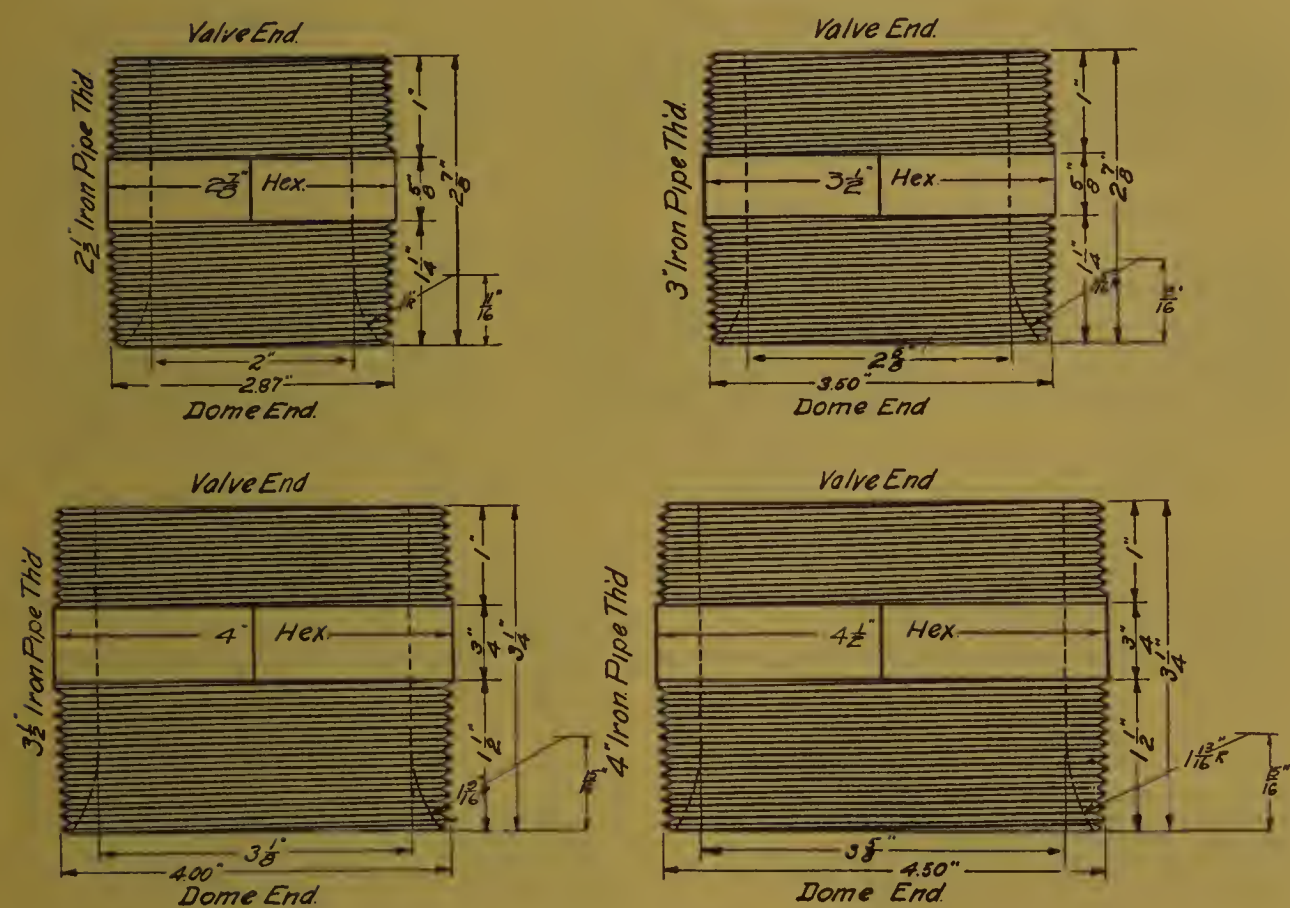
No. 37

The above cuts show the dimensions of standard cast nipples for Ashton No. 28 and No. 30 Valves in the regular sizes of 2 1/2 inch, 3 inch, 3 1/2 inch and 4 inch. The top connection is made smaller to fit the reduced size of the valve inlet. The threads are all standard pipe size.

These nipples are substantially made of high grade bronze castings and give durable and satisfactory service. We do not recommend greater lengths or smaller diameters than mentioned above.

SAFETY VALVE DOME CONNECTIONS
OR NIPPLES

RECOMMENDED PRACTICE



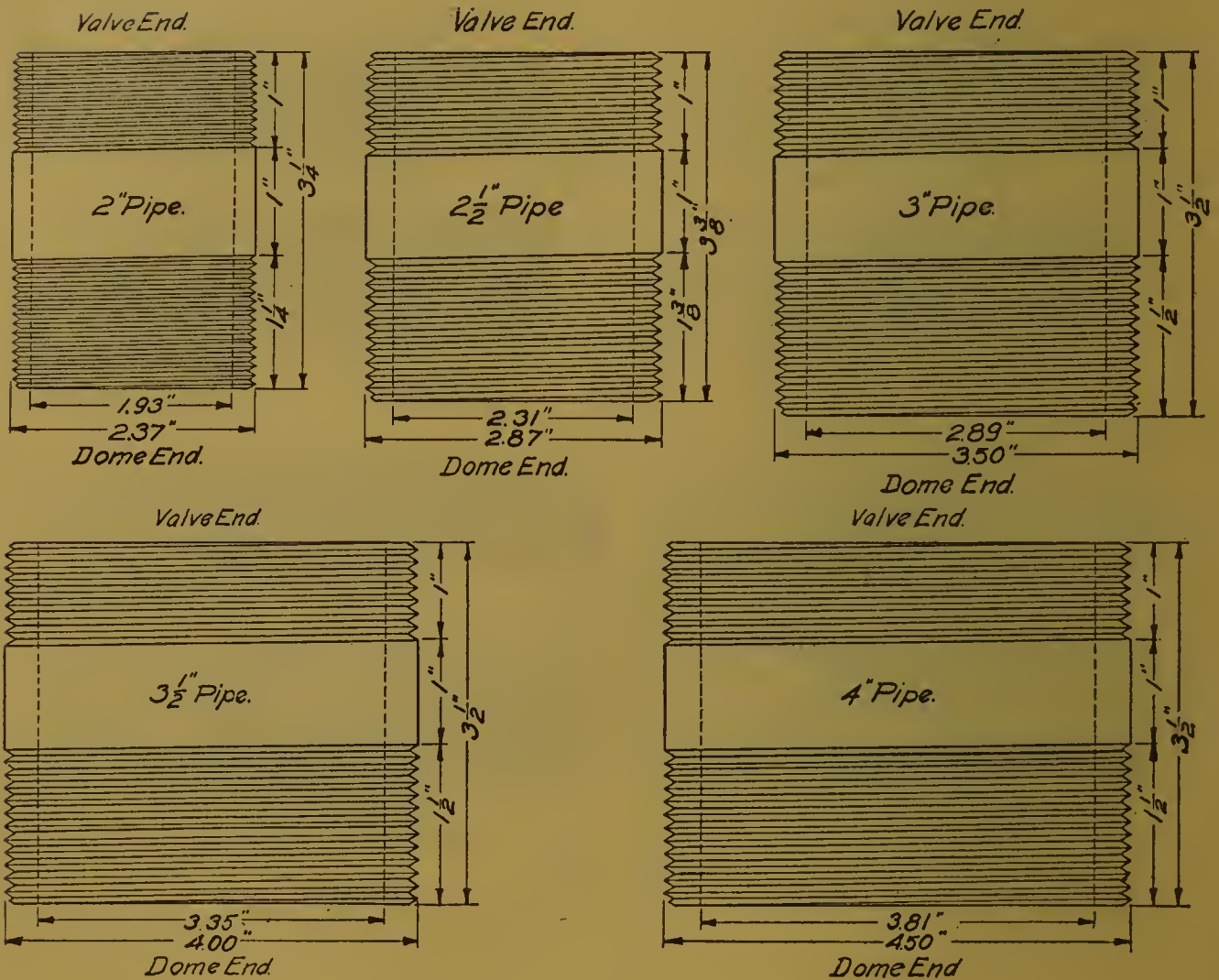
No. 38

The above cuts show the dimensions of standard cast nipples for Ashton Master Mechanics and Increased Lift Styles of Muffled and Open Pop Valves in the regular sizes of 2½ inch, 3 inch, 3½ inch and 4 inch. Both top and bottom ends are of the same standard pipe sizes.

These nipples are substantially made of high grade bronze castings and will give durable and satisfactory service. We do not recommend greater lengths or smaller diameters than above specified.

SAFETY VALVE DOME CONNECTIONS OR NIPPLES

RECOMMENDED PRACTICE



The above cuts show the dimensions of our extra heavy brass pipe space nipples threaded on both ends to iron pipe size for 2 inch, 2 1/2 inch, 3 inch, 3 1/2 inch and 4 inch valve and dome connections.

We do not recommend a greater length than above specified, and believe that the styles as shown on pages 44 and 45 will be found to be more convenient and satisfactory owing to the hexagon wrench size fit.

LOCOMOTIVE PRESSURE GAGES

Locomotive service, with its high pressures and severe external vibrations, calls for a double-spring pressure gage of substantial construction, which is distinctly superior for this kind of service to the single-spring type. The double spring eliminates most of the vibration of the gage hand and causes a steadier operation of the gage movement, resulting in much less wear and greater durability.

Ashton Locomotive Gages are the result of a careful study of railway conditions. That they meet all requirements is evident from an inspection of the gages themselves and the fact that they are giving such excellent service on a great majority of the largest railroads.

Seamless drawn brass tube spring, well seasoned to prevent set, and subjected to a pulsating or whip test at 100 per cent above working pressure, which removes stresses set up in process of forming, movement of noncorrodible metals with nickel silver pinions and shafts, phosphor bronze sector and bushings, these features insure accuracy not only when the gage is first put into service but after long, hard use.

The inside back of gage case on which movement is mounted is machined — also tops of dial posts and inside of case for proper fit and alignment of dials. This machine work insures perfect relation of the parts. The front edge of case is finished, affording an even bearing which prevents glass from coming loose.

While all Ashton gages combine the best of materials and most skillful workmanship, we have developed certain designs that best meet the requirements of various conditions, and to insure most satisfactory service the proper type should be selected.

We also make gage testing and proving outfits for locomotive inspectors who are required to test the steam gages more frequently than heretofore according to the rules of the Interstate Commerce Commission.

Certain gage numbers have been revised and table below explains the changes.

- Style No. 52. Original Lane style.
- Style No. 52J. Same as No. 52 with dustproof case.
- Style No. 52R. Same as No. 52 with bar link No. 6 changed to adjustable link.
- Style No. 52RA. Same as No. 52R with dustproof case.
- Style No. 52LB. Original Lane Bourdon gage.
- Style No. 52LBE. Same as No. 52LB with dustproof case.
- Style No. 52LBD. Same as No. 52LB with new style linkage.
- Style No. 52LBDA. Same as No. 52LBD with dustproof case.

GENERAL INFORMATION ON GAGES

STEAM GAGE CONNECTIONS should always be made direct to boiler shell and not to fountain head or pipes. The fluctuation of pressure therein will falsify the reading and injure the sensitive movement. Where the above practice cannot be followed, protect the gage movement by partially closing the stop cock until the hand ceases to vibrate, using care not to diminish the pressure on the gage in so doing.

STEAM GAGE SIPHONS. All steam gages must be protected by siphons *filled with cold water* and of sufficient length to prevent heat reaching the gage tubes. Frequently gages are ruined by short siphons, turning steam into the gage without filling siphon with water, or leaky unions and connections, allowing the live steam to reach the tubes and anneal them.

LOCATION OF GAGES. It is essential that gages be protected from extreme heat and properly insulated from the boiler shell. Gages located over fire doors, or on top of large boilers with short space between boiler and cab roof, have been found sustaining a temperature of 200 degrees and, due to this heat, 20 pounds fast.

TORCHES LAID UNDER STEAM GAGES, on the road and in Round Houses while firing up locomotives, are frequently the cause of gage trouble.

GAGE CASES STRAINED and movements injured are often the results of short connections and bolting gages to irregular surfaces.

GAGE GRADUATION should be approximately twice the working pressure for satisfactory results and durability.

INTERCHANGING OF GAGE DIALS should be avoided as much as possible; dials are usually made to the individual spring tubing and movements, therefore graduations vary on each dial.

SOLDERING OF TUBES cracked by frost, service, or defective material is poor practice. The solder destroys the elasticity of the tube, and gages so repaired cannot be accurate.

SIZE OF GAGES is determined by measuring across the dial, not the face ring or gage back.

SHOP NUMBER. Each gage has a shop number stamped upon the dial or movement, to which reference should be made in correspondence.

SHIPPING AND HANDLING GAGES. Utmost care should be exercised in handling gages. They are carefully packed by experienced men at our factory, but rough handling in shipment may produce variations we cannot avoid, therefore we recommend testing all gages before they are placed in service.

GAGES REPAIRED. Do not destroy or scrap old gages if the cases are intact; we can reclaim them, having a Special Department at our FACTORY, CAMBRIDGE (BOSTON), MASS., where we repair ALL MAKES AND STYLES OF GAGES.

INSTRUCTIONS FOR ORDERING GAGES AND PARTS

COMPLETE GAGES. Always give size (note below), style, designating number and names; specify iron or brass case, maximum graduation desired, not working pressure.

CONNECTION OF GAGES. Unless otherwise specified, $\frac{1}{4}$ inch Standard Male Pipe Thread Connections will be furnished.

SPRING TUBES. Give size of gage, style, and maximum graduation. Tubes are always furnished complete with sockets and tips.

ALL PARTS. Give size of gage, style, maximum graduation, number and name of parts desired. See cuts and part lists for proper reference.

MARKING DUPLEX AIR GAGES. Always specify marking desired on dials; otherwise they will be marked as follows:

5 inch size, RED HAND — MAIN RES.

BLACK HAND — EQ'L'G. RES.

3½ inch size, RED — CYLINDER

BLACK — BRAKE PIPE

CONNECTIONS DUPLEX AIR GAGES. On new gages connections are side by side and unless otherwise specified, repair connections will be so sent. Fore and aft connections (old style Westinghouse) should be specified if desired; also one or two pieces. All standard sockets are one piece; two pieces are used for fore and aft only, and then only when specified.

SHOP NUMBER is stamped upon the dial or movement. If in doubt regarding style of gage, give shop number as reference.

SHIPMENTS. Always specify routing; Freight, Express or Parcel Post. All parcel post shipments are insured, and at customer's expense.

TO AVOID ERRORS. Please be specific in your orders. Mistakes we studiously endeavor to avoid, but they will occur sometimes, and we are only too glad to correct any made by us.

Note: Size of gages is determined by measuring across the dial, not the face ring or gage back.

SPECIAL INSTRUCTIONS ON CARE OF AND REPAIRS TO GAGES

Please read carefully the article under subject, "General Information on Gages." Valuable suggestions resulting from years of experience are given therein, and to same may be added the following for the benefit of the men in charge of gage repairs:

USE GRAPHITE on all moving joints and gage rings where screwed on case; it will reduce friction and prevent wear. It is more satisfactory than oil, which attracts and holds dust.

GAGE SIPHONS. Always fill them with water before opening steam connection to gage. Not infrequently gage tubes are ruined by neglecting this precaution, allowing live steam to reach them.

UNIONS AND GAGE COCKS. Test them and see that they are in perfect condition; a leak may result in a gage failure.

LARGE WRENCHES should never be used in making up gage connections. The small connections require no long wrenches to make them up tight, and the strain produced may injure the movement or break the sockets.

GAGE HANDS are a taper fit and should not be driven on with a large hammer. This practice frequently bends the arbor.

GAGE TAKE-UP. Gages are usually made with 2 to 5 pounds take-up to prevent vibration wearing the movement and to hold the hand firmly against the stop-pin when the gage is not in service or when it is being handled in shipment; therefore the unequal spacing between the stop-pin and the first division or graduation mark. This take-up should be maintained and the small hair springs kept in good condition.

HAIR SPRINGS should not be reversed as gages will not read correctly unless readjusted.

Ordinarily the hair spring works with the Bourdon tube but in the Quadruplex gage it works against the Bourdon tube and care should be used to maintain this condition when reassembling.

REDUCING VALVE APPLICATION. Gages working in connection with a reducing valve should be graduated as high as the boiler pressure to protect them in case of reducing valve failure.

PULSATION RETARD DEVICE No. 120, page 53 in Catalog 28, should be used whenever a gage is subject to excessive pulsations.

On No. 52 D. I., 62 Q. I. and all other illuminated dial gages, the inside of lamp housing and inside of case between dial and glass are coated with aluminum paint to reflect and diffuse the light. To maintain the greatest efficiency these surfaces should be refinished whenever they become dull or dirty.

The transparent covering of the slot in top of No. 62 Q. I. case should be wiped occasionally with clean, not oily, waste as dust will stick to a film of oil. If necessary it can be renewed at small expense.

ASHTON IMPROVED LOCOMOTIVE STEAM AND AIR GAGES

Their Design and Description

Ashton Gages are carefully and conscientiously made, and the product of the best material and skilled labor combined. Their reputation is second to none, and we warrant them to be superior in quality, durability, and accuracy. They are made with seamless drawn-brass tubes. The movements are of heavy construction and non-corrodible, having nickel silver pinions and shafts, phosphor bronze sectors and bushings. The letters and figures are deeply indented on all dials of the silvered or black type and indelibly imprinted on the white enamel style, so they can be easily read and will not wear off. The springs are well seasoned to prevent setting. Siphons must invariably be used on all steam gages, so that no steam will enter the gage.

Below and on the following pages are given detailed descriptions of the most important styles used in railroad service.

NUMBER 52 U. S. $6\frac{3}{4}$ INCH

United States Government Standard Style Locomotive Steam Gage, $6\frac{3}{4}$ dial, dust proof iron case, brass threaded ring, style "A." A special style of Ashton Locomotive Steam Gage as approved and adopted for use by the United States Railroad Administration for their standard locomotives. Four hundred pound black dial, white enamel graduations and hand.

For list of parts see page 54. Price list parts, page 64.

NUMBER 52 U. S. $4\frac{1}{2}$ INCH

United States Government Standard Style Locomotive Steam Heat Gage, $4\frac{1}{2}$ dial size, iron case, brass threaded ring, style "A," black dial, white enamel graduations, figures and hand; maximum graduation 240 pounds.

For list of parts see page 54. Price list of parts, page 64.

NUMBER 52A. DOUBLE SPRING

This gage is of the same general construction as our No. 52 L. B. D. style locomotive steam gage, but usually required in smaller sizes with either $4\frac{1}{2}$ inch or 5 inch dial, and graduated to a maximum of 160, 200 or 230 pounds; 230 pounds is standard. It is made with large and prominent figures on the dial, which can be easily read, and the dials can be furnished silvered, black or white enamel, as specified. Ring is style "K," threaded. The successful performance of this gage in railroad service warrants our special recommendation of it for locomotive steam heat applications.

The list of parts is the same as those of the No. 52 L. B. D. style shown on page 54. Price list of parts, page 64.

INFORMATION FOR APPLICATION AND SERVICE OF LOCOMOTIVE BACK PRESSURE GAGES

THE ASHTON DUPLEX LOCOMOTIVE BACK PRESSURE GAGE is designed to indicate the effective pressure on the pistons of the locomotive. The steam chest pressure (large dial) pipe line is connected to the live steam passage between the throttle and the cylinder. The back pressure (small dial) pipe line is connected to the exhaust passage of the cylinders.

The difference between the two pressures, namely steam chest pressure minus back pressure represents the actual effective pressure in the cylinder up to the point of cut-off.

When the locomotive is at rest both hands are at 0. When the throttle is open the large hand indicates the maximum steam chest pressure, which should, in operation of the locomotive, be maintained as near the maximum boiler pressure as possible. As the locomotive gains speed, back pressure is built up and indicated on the small dial and the cut-off should be set back or reduced to use the steam expansively, thereby cutting down the back pressure.

It is most desirable to operate the locomotives with a minimum difference between the working boiler pressure and the initial steam chest pressure, with the proper throttle opening and position of reverse lever, so as to maintain the desired running speed and carry as low a back pressure as possible. This practice will give the best results in fuel economy. By frequently comparing the steam chest pressure with the locomotive boiler pressure gage, when the locomotive is in operation, any drop in steam chest pressure can be noted, and such indicates the necessity of readjustment of the throttle and cut-off to the speed of the engine.

The above illustrates an ideal condition or general principle but locomotives vary so much that each has a back pressure peculiar to itself, that will give the maximum draw bar horsepower.

The No. 62 B. O. and No. 62 B. P. style gages have a vacuum scale on the large dial, so that if vacuum is built up when the locomotive is drifting, it will be indicated by the large hand and the engineer may relieve same by opening the drifting valve or throttle in accordance with the practice or rules of the railroad.

The rapid fluctuation of pressure on these gages is compensated for by using a needle valve retard device, which should be so adjusted as to eliminate violent vibration of the hands, but permitting them to rise or fall gradually with the variable pressure. A very slight movement of the needle valve will accomplish the desired results and frequent alterations or adjustments are unnecessary. Adjustments should be made only when the gage is in operation, and at the average working pressure. To blow out any sediment that may lodge on the seat, close the needle valve, remove pipe plug and open the needle valve. *Caution.* We recommend the work of cleaning or blowing out of the retard devices be handled at the shops. If done on the road care must be taken to avoid leaks and escaping steam.

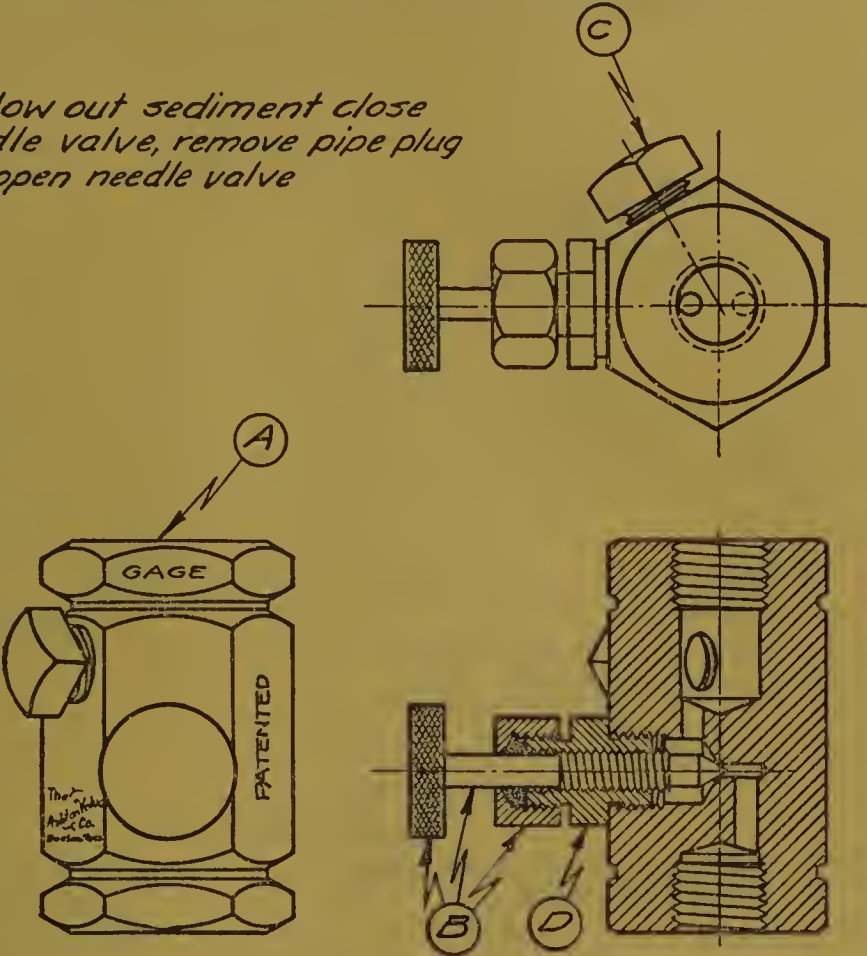
Blueprint showing piping arrangement for connecting gages and retard devices will be furnished on request.

ASHTON PULSATION RETARD DEVICE

There is a blow out passage through the body "A" and across the seat of the needle valve "B," and by removing plug "C" it is possible to blow out any sediment that may have lodged on the seat or in the passage.

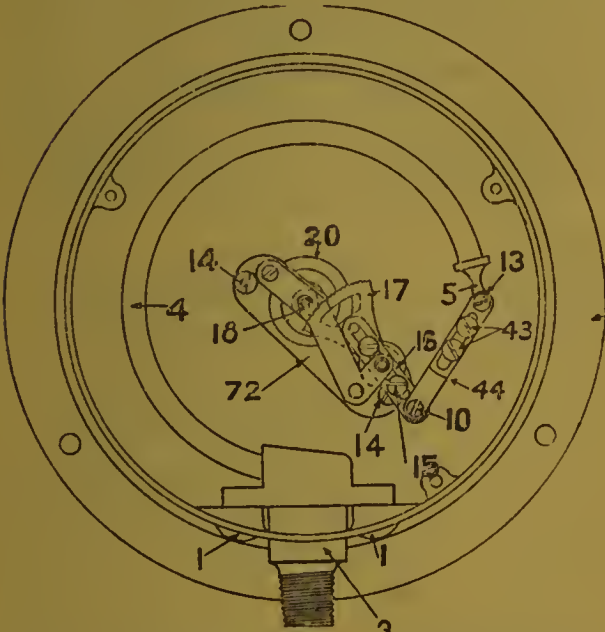
The No. 51 Type Single Spring Gage is extensively used on railroads as the pressure gage on the steam heat system in coaches. It is also commonly used as the single air gage on locomotives and the regular standard style for stationary boilers. It is generally known as the Bourdon spring type and made in several sizes, from 2½ inch to 24 inch diameter dials, with either iron or brass case, of which complete list is shown in our general catalogue.

To blow out sediment close needle valve, remove pipe plug and open needle valve



No. 120

ASHTON SINGLE SPRING PRESSURE GAGE



No. 51B Single Air Gage
No. 51C Caboose Gage (Single Spring)

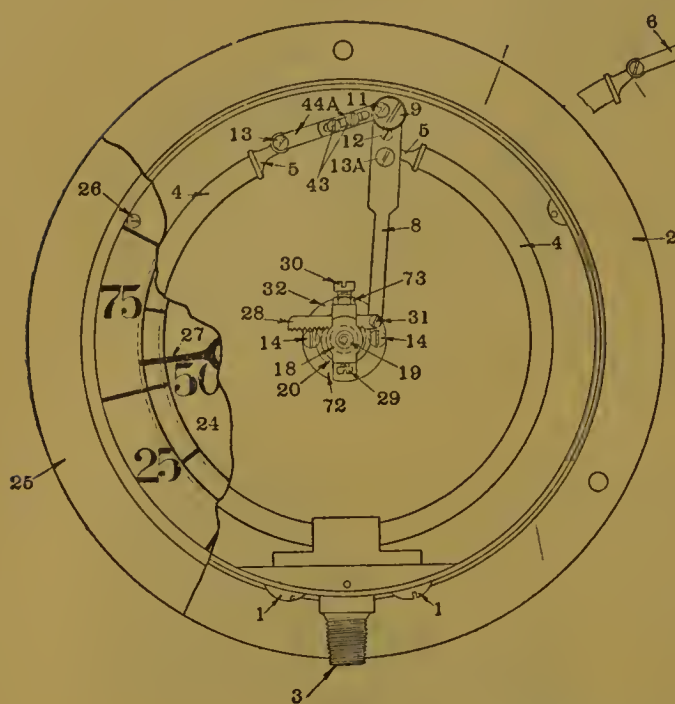
LIST OF PARTS

- 1. Socket Screw
 - 2. Case
 - 3. Socket, ¼ inch pipe
 - 4. Spring
 - 5. Tip
 - 10. Connection Arm Screw
 - 13. Tip Connection Screw
 - 14. Movement Case Screw
 - 15. Adjusting Slide Lock Screw
 - 16. Adjusting Slide
 - 17. Sector
 - 18. Pinion
 - 20. Hair Spring
 - 24. Dial (not shown)
 - 25. Ring (not shown)
 - 26. Dial Screw (not shown)
 - 27. Hand (not shown)
 - 34. Glass (not shown)
 - 43. Adjustable Link Screw
 - 44. Adjustable Link, complete
 - 72. Movement, complete
 - 75. Hand Stop Pin (not shown)
- Solid Link

7, in 3 ½ in.

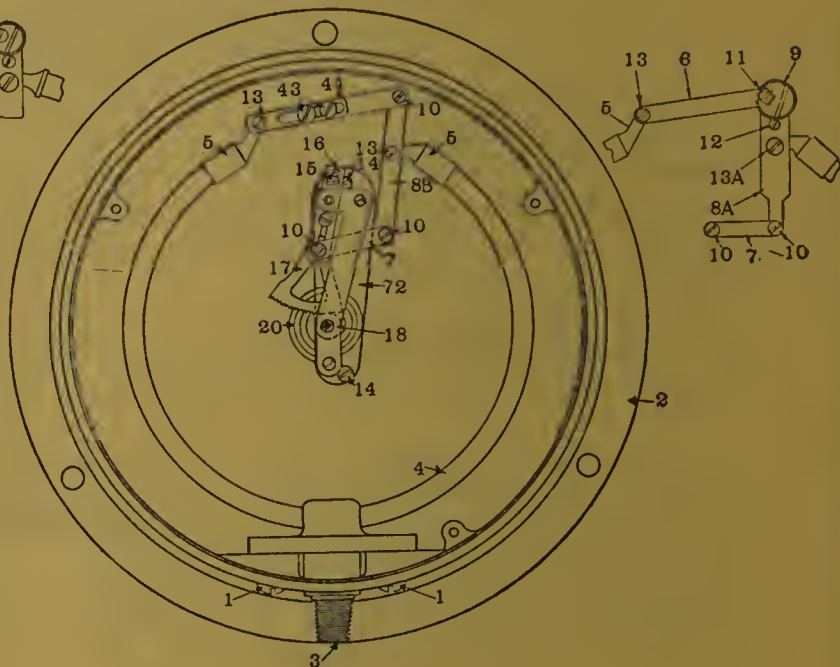
In ordering parts give style and size of gage, iron or brass case. For springs and dials give maximum graduation. For price list of parts see page 65.
For styles of hands and rings see pages 71 and 74.

ASHTON IMPROVED LOCOMOTIVE STEAM GAGES



No. 52
No. 52J (Dust Proof)

No. 52R Locomotive Steam Gage
No. 52RA (Dust Proof)



No. 52 L. B.
No. 52 L. B. E. (Dust Proof)

No. 52 L. B. D. Locomotive Steam Gage
No. 52 L. B. D. A. (Dust Proof)
No. 52 U. S. Locomotive Steam Gage
No. 52 U. S. Locomotive Steam Ht. Gage
No. 66 Locomotive Steam Gage
No. 52A Locomotive Steam Ht. Gage
No. 52 L. B. D. B. Locomotive Stoker Gage

The Ashton Lane Bourdon type locomotive steam gage is designed to meet the conditions of close regulation required by the Federal Boiler Inspectors' rules. It combines the sensitiveness of our Standard Test Gage and the durability of our well-known No. 52 Gage. It has dust-proof (felt gasket) threaded ring, preventing loose and broken glass due to expansion; wide sector and bushings of phosphor bronze; pinion and shafts of nickel silver, making absolutely non-corrodible movement. The double seamless drawn tubing, made from one piece, gives greatest durability and prevents freezing. Springs are well seasoned to prevent setting. Rings are made O. G. or flush style, and dials silvered, black, or white enamel, and graduated to 300, 400 or 500 pounds, or any specified maximum. We solicit a trial order to prove the merits of this gage.

LIST OF PARTS

- | | | |
|--------------------------|--------------------------------|-----------------------------------|
| 1. Socket Screw | 13. Lever Connection Screw | 29. Bushing Screw |
| 2. Case | 13A. Lever Connection Screw | 30. Rack Adjusting Screw |
| 3. Socket, 1/4 inch pipe | 14. Movement Case Screw | 31. Rack Connecting Screw |
| 4. Spring | 15. Adjusting Slide Lock Screw | 32. Movement Frame |
| 5. Tip | 16. Adjusting Slide | 34. Glass (not shown) |
| 6. Main Connection Arm | 17. Sector | 43. Adjustable Link Screw |
| 7. Movement Connection | 18. Pinion | 44-44A. Adjustable Link, complete |
| 8. Lever | 19. Bushing | 72. Movement, complete |
| 8A. Lever | 20. Hair Spring | 73. Rack Adjusting Screw Lock Nut |
| 8B. Lever | 24. Dial | 74. Felt (not shown) |
| 9. Hub | 25. Ring | 75. Hand Stop Pin (not shown) |
| 10. Connection Screw | 26. Dial Screw | |
| 11. Hub Screw | 27. *Hand | |
| 12. Lock Screw | 28. Rack | |

* Specify black or white.

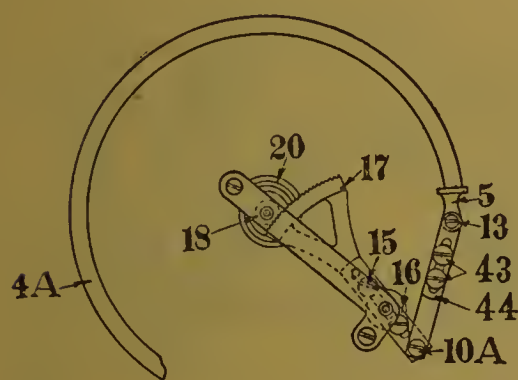
In ordering parts specify style number of gage, size, maximum dial graduation, iron or brass case, O. G. or flush ring, and whether silvered, black or white enamel dial.

For price list of parts see pages 64 and 67.

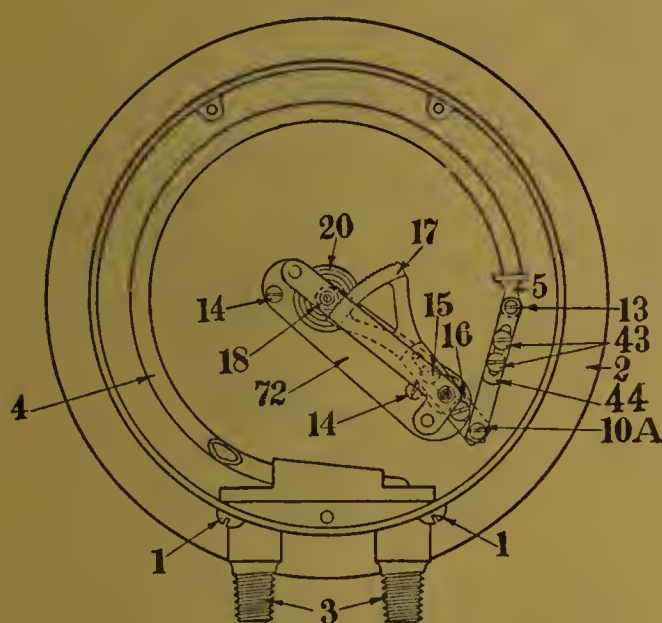
For description of revised numbers see page 47.

For styles of hands and rings see pages 71 and 74.

ASHTON IMPROVED DUPLEX AIR BRAKE AND STEAM JET GAGES



UPPER SPRING & CONNECTIONS.



LOWER SPRING & CONNECTIONS.

5-inch No. 62 B.

5-inch No. 62 B. U.
(Single Spring)

LIST OF PARTS

1. Socket Screw
2. Case
3. Socket, $\frac{1}{4}$ -inch pipe
- [4. Lower Spring
- 4A. Upper Spring
5. Tip
- 10A. Movement Arm Connection Screw
13. Tip Connection Screw
14. Movement Case Screw
15. Adjusting Slide Lock Screw
16. Adjusting Slide
17. †Sector
18. †Pinion
20. †Hair Spring
24. Dial (not shown)
25. Ring (not shown)
26. Dial Screw (not shown)
27. *Hand (not shown)
34. Glass (not shown)
43. Adjustable Link Screw
44. Adjustable Link, complete
72. Movement, complete
75. Hand Stop Pin (not shown)

* Specify red or black hand.

† Specify upper or lower.

In ordering parts specify style number of gage, maximum graduation for springs and dials, whether iron or brass case, dial marking desired.

Unless otherwise specified socket connections will be furnished parallel to back of case. Old style Westinghouse is fore and aft.

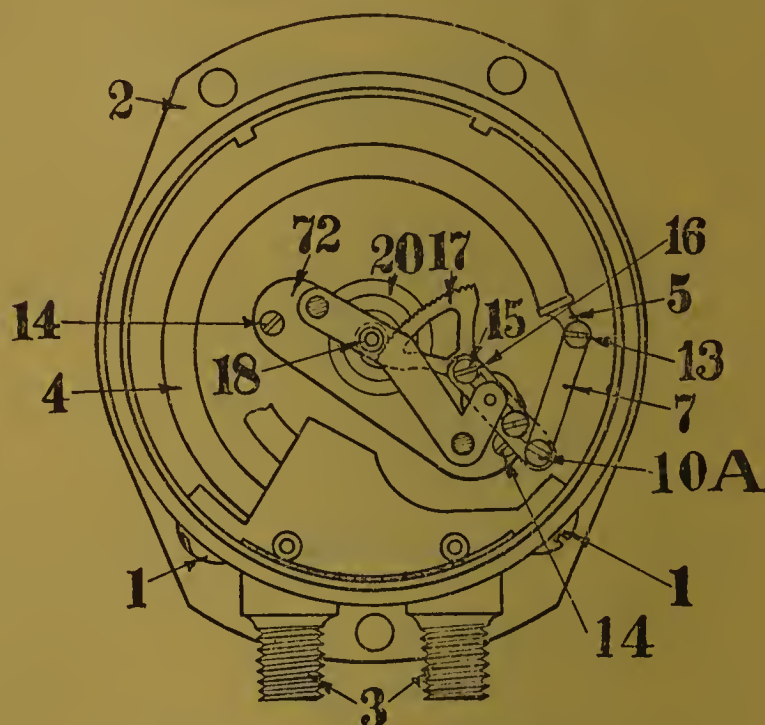
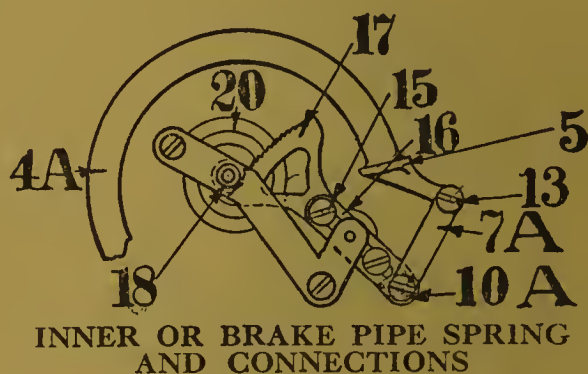
The 5-inch Single Spring Duplex Air Brake Gage, as above shown, has single instead of double spring. All wearing parts are extra heavy and made of material best suited to the service.

Price list of parts on page 65.

ASHTON IMPROVED DUPLEX AIR BRAKE GAGE

LIST OF PARTS

1. Socket Screw
2. Case
3. Socket, 1/4-inch pipe
4. Outer or Cylinder Spring
- 4A. Inner or Brake Pipe Spring
5. Tip
7. Outer Movement Connection Arm
- 7A. Inner Movement Connection Arm
- 10A. Movement Arm Connection Screw
13. Tip Connection Screw
14. Movement Case Screw
15. Adjusting Slide Lock Screw
16. Adjusting Slide
17. †Sector
18. †Pinion
20. †Hair Spring
24. Dial (not shown)
25. Ring (not shown)
26. Dial Screw (not shown)
27. *Hand (not shown)
34. Glass (not shown)
72. Movement, complete
75. Hand Stop Pin (not shown)



3 1/2-inch No. 62C
Duplex Air Brake Gage
(Single Spring)

*Specify black or red hand.

†Specify upper or lower.

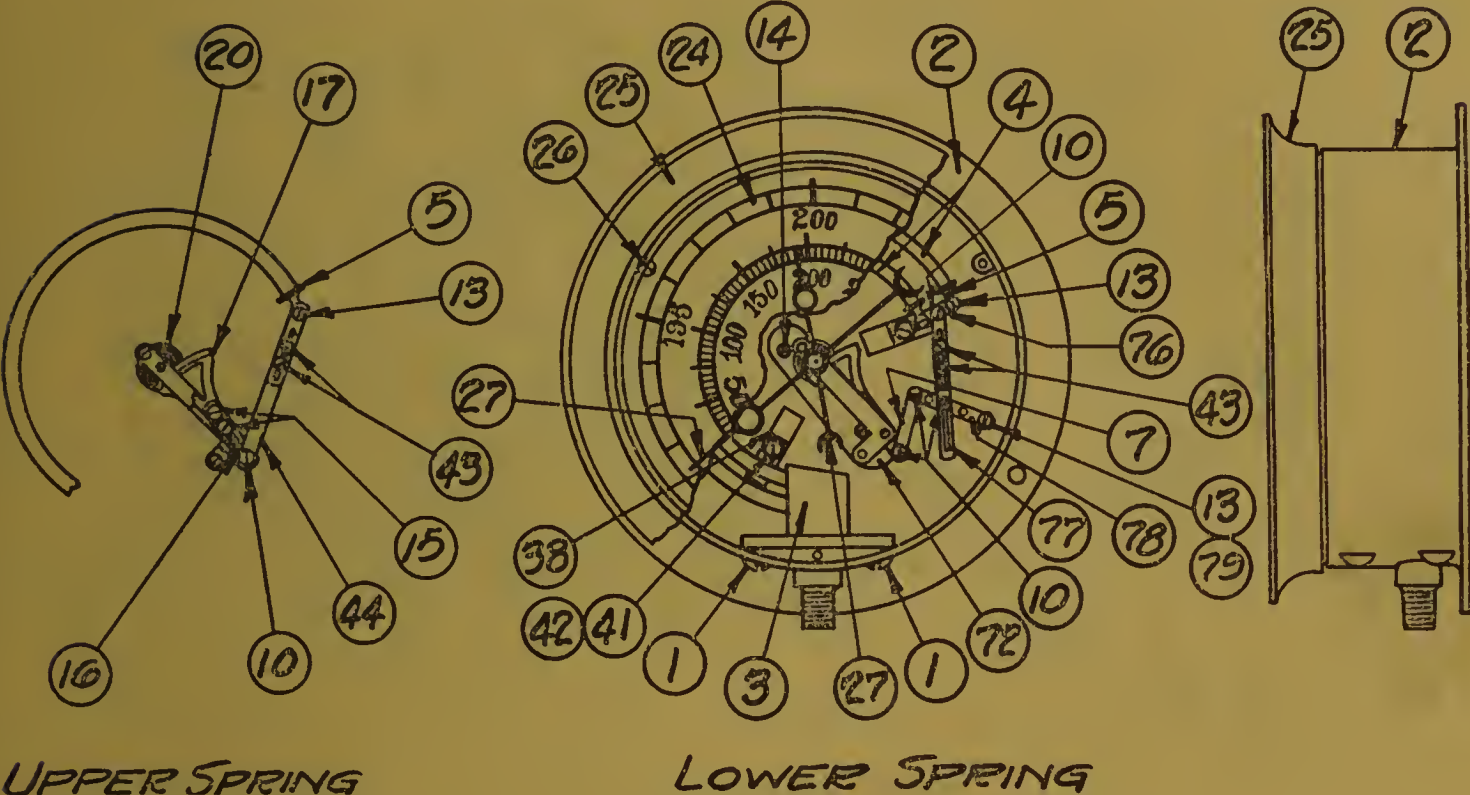
The 3 1/2-inch Duplex Air Brake Gage, single spring style, is specially designed for use in connection with the L. T. and E. T. Air Brake Equipment. It is usually graduated to 160 pounds maximum, with dial marked: RED-CYLINDER; BLACK-BRAKE PIPE.

In ordering parts specify style number of gage; maximum dial graduation; iron or brass case. Unless otherwise specified socket connections will be furnished parallel with back of case. Old style Westinghouse is fore and aft.

For price list of parts see page 65.

For styles of hands and rings see pages 71 and 74.

ASHTON LOCOMOTIVE MASTER
PILOT GAGE



No. 62 B. B.

LIST OF PARTS

1. Socket Screw	17. †Sector	43. Adjustable Link Screw
2. Case	18. †Pinion	44. Adjustable Link, complete
3. Socket, ¼-inch pipe	20. †Hair Spring	53. Movement Lift (not shown)
4. Spring	24. Dial	72. Movement, complete
5. Tip	25. Ring	76. Tip Connection Link
7. Movement Connection Arm	26. Dial Screw	77. Adjustable Take-Up Link
10. Connection Screw	27. *Hand	78. Take-Up Link
13. Tip Connection Screw	34. Glass (not shown)	79. Pivot Post
14. Movement Case Screw	38. Spring Stop Post	* Specify black or white, long or short.
15. Adjusting Slide Lock Screw	41. Spring Stop Post Screw	† Specify upper or lower.
16. Adjusting Slide	42. Spring Stop Post Washer	

The special feature of the 62 B. B. Gage is the outer circle with coarse graduations which show pressure variations more plainly than the ordinary gage.

In ordering parts specify style number of gage; inner and outer graduations; iron or brass case.

For price list of parts see page 66.

For styles of hands and rings see pages 71 and 74.

ASHTON LOCOMOTIVE DUPLEX BACK PRESSURE AND VACUUM GAGES



No. 62 B. A. and No. 62 B. O.

LIST OF PARTS

- | | | |
|--------------------------------|-----------------------|-------------------------------|
| 1. Socket Screw | 17. †Sector | 38. Spring Stop Post |
| 2. Case | 18. †Pinion | 39. Connection Arm Screw |
| 3. Socket, ¼-inch pipe | 20. †Hair Spring | 40. Connection Arm |
| 4. Spring | 24. Dial | 41. Spring Stop Post Screw |
| 5. Tip | 25. Ring | 42. Spring Stop Post Washer |
| 10. Connection Screw | 26. Dial Screw | 43. Adjustable Link Screw |
| 13. Tip Connection Screw | 27. *Hand | 44. Adjustable Link, complete |
| 14. Movement Case Screw | 34. Glass (not shown) | 53. Movement Lift (not shown) |
| 15. Adjusting Slide Lock Screw | 37. Tension Spring | 72. Movement, complete |
| 16. Adjusting Slide | | |
- * Specify black or white, long or short. † Specify upper or lower.

The 62 B. A. and B. O. Gages are for indicating the steam chest and back pressures in locomotive cylinders and have been instrumental in producing some very satisfactory results in fuel economy by reducing back pressure on locomotives as by their use the engineman can adjust the cut-off at the best point.

In ordering parts specify style number of gage, iron or brass case and maximum pressures.

For parts of lighting attachment see page 60.

For price list of parts see page 66.

For styles of hands and rings see pages 71 and 74.

THE ASHTON LOCOMOTIVE DUPLEX
BACK PRESSURE AND VACUUM GAGES



No. 62 B. P.
No. 62 B. P. A.

LIST OF PARTS

1. Socket Screw	17. †Sector	38. Spring Stop Post
2. Case	18. †Pinion	39. Connection Arm Screw
3. Socket, ¼-inch pipe	20. †Hair Spring	40. Connection Arm
4. Spring	24. Dial	41. Spring Stop Post Screw
5. Tip	24.R Dial, Rotating	42. Spring Stop Post Washer
10. Connection Screw	25. Ring	43. Adjustable Link Screw
13. Tip Connection Screw	26. Dial Screw	44. Adjustable Link, complete
14. Movement Case Screw	27. *Hand	53. Movement Lift (not shown)
15. Adjusting Slide Lock Screw	34. Glass (not shown)	72. Movement, complete
16. Adjusting Slide	37. Tension Spring	

* Specify black or white.
† Specify upper or lower

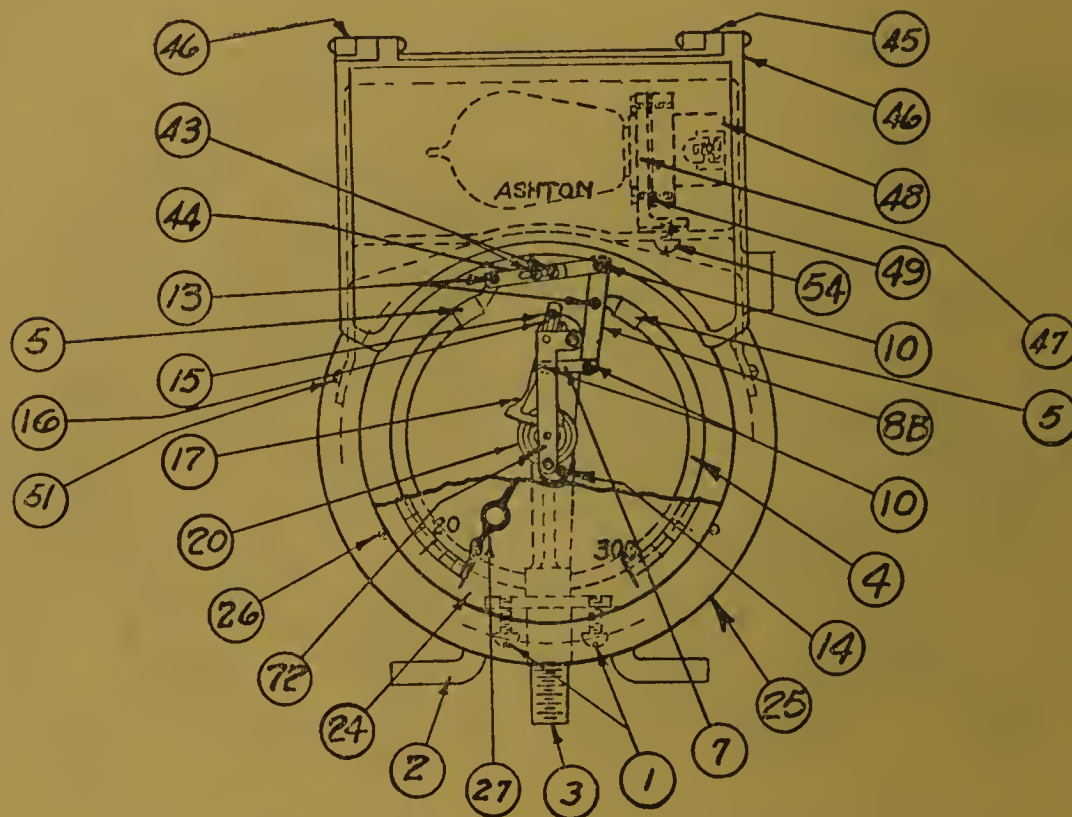
These gages are similar in construction to No. 62 B. A. and No. 62 B. O. but have the distinctive feature of the graduations for back pressure on a rotating dial which may be read through the opening in the large dial. .

In ordering parts specify style number of gage; maximum dial graduation; iron or brass case; dial marking desired.

For price list of parts see page 66.

For styles of hands and rings see pages 71 and 74.

DOUBLE DIAL LOCOMOTIVE STEAM GAGE



No. 52 D. I. No. 52 D. (Without lighting attachment)

LIST OF PARTS

1. Socket Screw	16. Adjusting Slide	45. Lamp Case or Frame
2. Case	17. Sector	46. Lamp Case Cover
3. Socket, ¼-inch pipe	18. Pinion	47. Receptacle Holder
4. Spring	20. Hair Spring	48. Receptacle
5. Tip	24. Dial	49. Receptacle Washer
7. Movement Connection Arm	25. Ring	51. Lamp and Gage Case Cover
8B. Lever	26. Dial Screw	Screw
10. Connection Screw	27. *Hand	54. Receptacle Holder Screw
13. Tip Connection Screw	34. Glass (not shown)	72. Movement, complete
14. Movement Case Screw	43. Adjustable Link Screw	75. Hand Stop Pin (not shown)
15. Adjusting Slide Lock Screw	44. Adjustable Link, complete	

* Specify black or white.

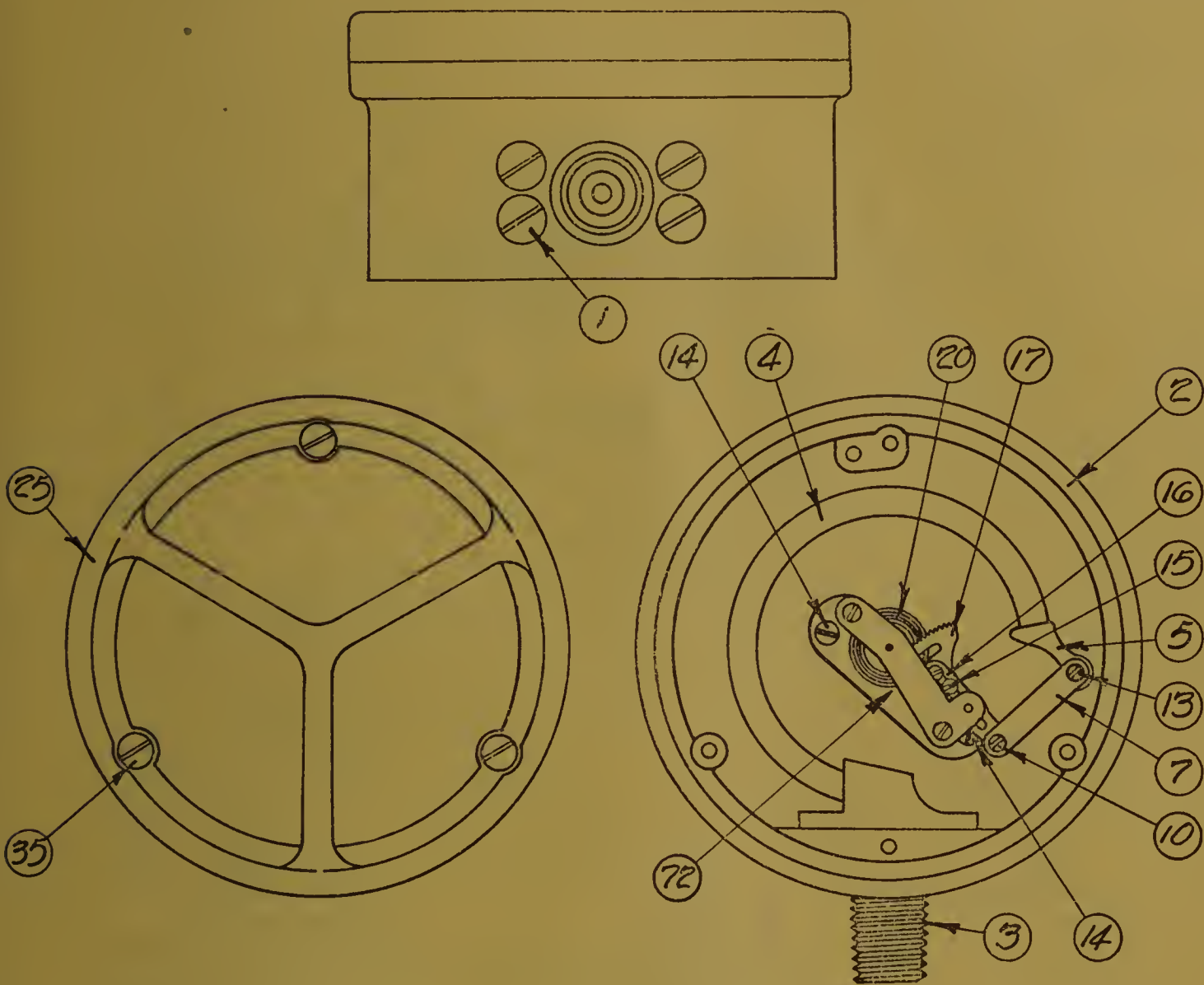
The No. 62 D. and 62 D. I. Gages take the place of two gages by having a dial on each face, so that when placed on top of or in front of the fire box end of the boiler they can be read by either engineer or fireman. The lighting attachment aids reading at night without interfering with the vision of the men.

In ordering parts specify style number of gage; maximum dial graduation; iron or brass case; finish of dial.

For price list of parts see page 66.

For styles of hands and rings see pages 71 and 74.

ASHTON PROTECTED DIAL
PRESSURE GAGE



No. 59C

LIST OF PARTS

- | | | |
|----------------------------|--------------------------------|-------------------------------|
| 1. Socket Screw | 14. Movement Case Screw | 25. Ring |
| 2. Case | 15. Adjusting Slide Lock Screw | 26. Dial Screw (not shown) |
| 3. Socket, 1/4-inch pipe | 16. Adjusting Slide | 27. Hand (not shown) |
| 4. Spring | 17. Sector | 34. Celluloid (not shown) |
| 5. Tip | 18. Pinion | 35. Ring Screw |
| 7. Movement Connection Arm | 20. Hair Spring | 72. Movement, complete |
| 10. Connection Screw | 24. Dial (not shown) | 75. Hand Stop Pin (not shown) |
| 13. Tip Connection Screw | | |

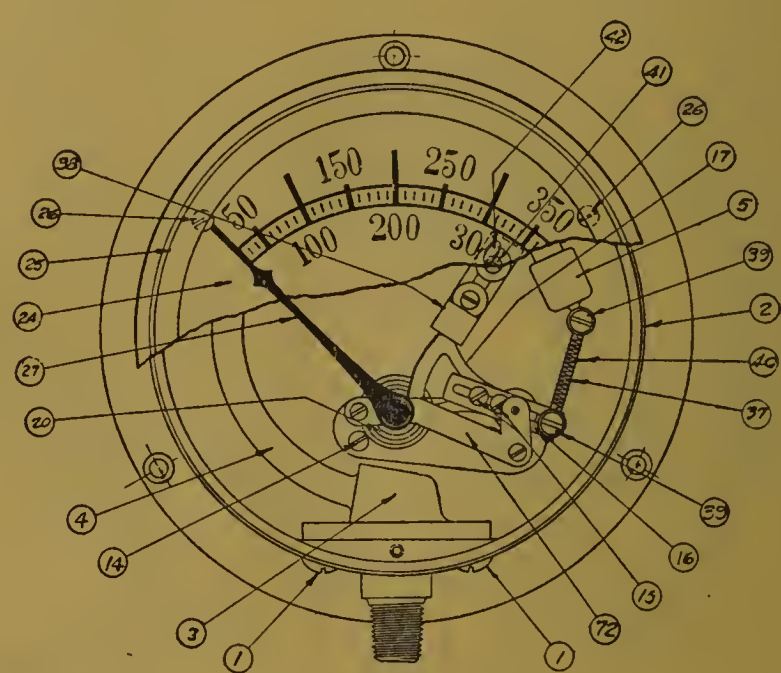
The 59C Gage is for air brake service on rear end train brake cock, and enables the man backing a train to know the pressure on the brake system.

In ordering parts specify style number of gage.

For price list of parts see page 65.

For styles of hands and rings see pages 71 and 74.

ASHTON SPECIAL
SINGLE SPRING PRESSURE GAGE



No. 51E
No. 51S

LIST OF PARTS

1. Socket Screw	17. Sector	37. Tension Spring
2. Case	18. Pinion	38. Spring Stop Post
3. Socket, 1/4-inch pipe	20. Hair Spring	39. Connection Arm Screw
4. Spring	24. Dial	40. Connection Arm
5. Tip	25. Ring	41. Spring Stop Post Screw
14. Movement Case Screw	26. Dial Screw	42. Spring Stop Post Washer
15. Adjusting Slide Lock Screw	27. Hand	72. Movement Complete
16. Adjusting Slide	34. Glass (not shown)	

The 51E and 51S Gages are extensively used on locomotive feed water heaters and are especially adapted to this severe service.

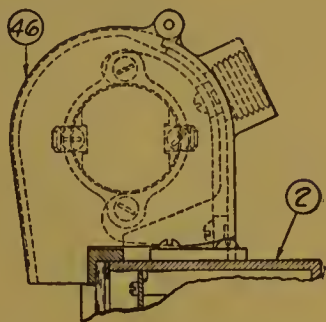
We strongly recommend the use of Retard Device No. 120 with these gages.

In ordering parts specify style number of gage, size, style of case, finish of dial and maximum graduation.

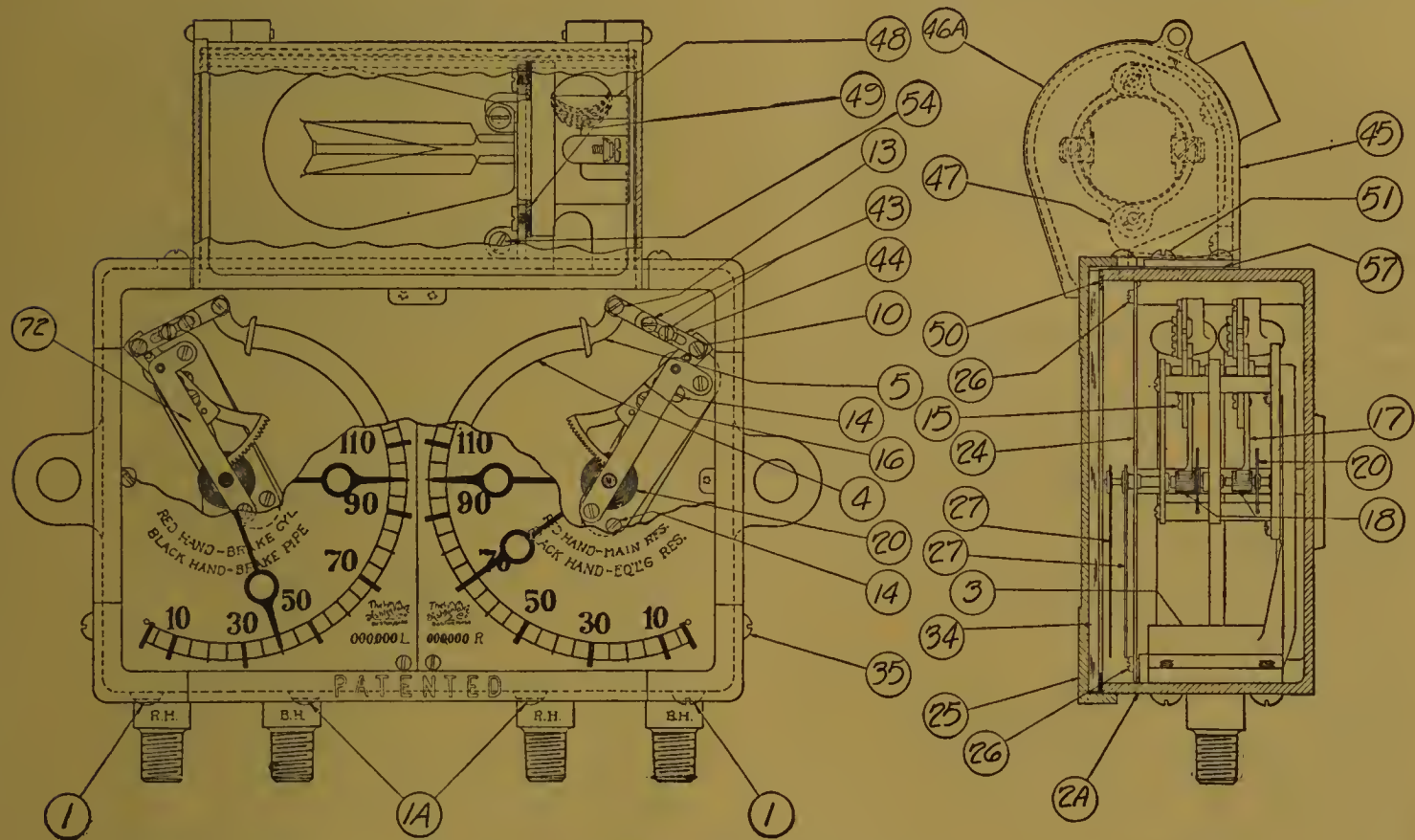
For price list of parts see page 66.

For styles of hands and rings see pages 71 and 74.

ASHTON 5-INCH DIAL
QUADRUPLEX AIR BRAKE
GAGE



No. 62 Q. E. Old style
Outside illumination



No. 62 Q. I. Inside direct illumination
No. 62 Q. (Without lighting attachment)

LIST OF PARTS

- | | | |
|--------------------------------|-------------------------------|------------------------------|
| 1, 1A. Soeket Screw | 18. †Pinion | 47. Receptaele Holder |
| 2. Case, 62 Q. and 62 Q. E. | 20. †Hair Spring | 48. Receptacle |
| 2A. Case, 62 Q. I. | 24. Dial | 49. Receptaele Washer |
| 3. Soeket, 1/4-inch pipe | 25. Ring | 50. Gasket |
| 4. Spring | 26. Dial Serew | 51. Lamp and Gage Case Cover |
| 5. Tip | 27. *Hand | Screw |
| 10. Connection Screw | 34. Glass | 54. Receptacle Holder Screw |
| 13. Tip Connection Serew | 35. Cover Serew (see 51) | 57. Transparent Slot Cover |
| 14. Movement Case Serew | 43. Adjustable Link Serew | 72. Movement, complete |
| 15. Adjusting Slide Lock Screw | 44. Adjustable Link, complete | 75. Hand Stop Pin |
| 16. Adjusting Slide | 45. Lamp Case or Fraime | * Specify black or red. |
| 17. †Sector | 46, 46A. Lamp Case Cover | † Specify upper or lower. |

In ordering parts specify style number of gage; maximum dial graduations; dial marking desired.

For price list of parts see page 66.

For styles of hands and rings see pages 71 and 74.

ASHTON LOCOMOTIVE STEAM AND

STEAM HEAT GAGES

LIST PRICES OF PARTS

STYLE NO.		No. 52US Steam Heat No. 52LBD No. 52A No. 52LB No. 52A No. 52LBE (Dust Proof) No. 52LBD No. 52LBDB No. 52LBDA (Dust Proof) No. 52LB No. 52LBE (Dust Proof) No. 52LBD No. 52LBDA (Dust Proof) No. 66 No. 52LB No. 52LBE (Dust Proof) No. 52LBD No. 52LBDA (Dust Proof) No. 66 No. 52US Loco. Steam (Dust Proof)					
SIZE, INCHES		4½	5	6	6¾	6¾	
NAME OF PART	Fig.	PRICE, EACH					
Socket Screw, Iron	1	\$0.08	\$0.08	\$0.08	\$0.08	\$0.08	
Socket Screw, Brass	1	.10	.10	.10	.10	.10	
Case, Iron	2	1.50	2.00	3.00	3.50	...	
Case, Iron, dust proof, Nos. 52US (6¾), 52LBE, 52LBDA only	2	...	2.50	3.50	4.00	4.00	
Case, Brass	2	4.00	4.50	5.50	6.50	...	
Case, Brass, dust proof, Nos. 52LBE, 52LBDA, only . . .	2	...	5.00	6.00	7.00	...	
Socket Spring and Tip, Complete not furnished separately, note below	3-4-5	2.00	2.50	2.80	3.00	3.00	
Conn. Arm, Nos. 52LB, 52US old style, 52LBE, only . . .	6	.10	.10	.10	.10	.10	
Movement Connection Arm	7	.10	.10	.10	.10	.10	
Lever, Nos. 52US old style (6¾), 52LB, 52LBE, only . . .	8A	...	.30	.50	.50	.50
Lever, Nos. 52LBD, 52LBDA, 52US, 52A, 66	8B	.20	.20	.20	.20	.20	
Hub, Nos. 52LB, 52LBE, only	9	...	.65	.65	.65	...
Connection Screw	10	.10	.10	.10	.10	.10	
Hub Screw, Nos. 52LB, 52LBE, only	11	...	.10	.10	.10	...
Hub Lock Screw, Nos. 52LB, 52LBE, only	12	...	.10	.10	.10	...
Tip Connection Screw	13	.10	.10	.10	.10	.10	
Lever Connec. Screw Nos. 52LB, 52LBE, only	13A	...	.10	.10	.10	...
Movement Case Screw	14	.10	.10	.10	.10	.10	
Adjusting Slide Lock Screw	15	.08	.08	.08	.08	.08	
Adjusting Slide	16	.10	.10	.10	.10	.10	
Sector	17	.60	.60	.60	.60	.60	
Pinion	18	.40	.40	.40	.40	.40	
Hair Spring	20	.20	.20	.20	.20	.20	
Dial, Silvered or Black note below, not shown	24	2.00	2.30	2.80	3.00	3.00	
Dial, White Enamel note below, not shown	24	...	2.50	3.00	3.30	...	
Ring, O. G. or Flush, Threaded . . . note below, not shown	25	2.50	2.75	3.00	3.50	...	
Ring, Threaded, dust proof, Nos. 52US (6¾), 52LBE, 52LBDA, only not shown	25	...	3.00	3.50	4.00	4.00	
Dial Screw not shown	26	.05	.05	.05	.05	.05	
Hand, Black or White note below	27	.15	.20	.20	.20	.20	
Glass not shown	34	.15	.15	.20	.20	.20	
Adjustable Link Screw	43	.10	.10	.10	.10	.10	
Adjustable Link, Complete	44	.45	.45	.50	.50	.50	
Felt, Nos. 52US (6¾), 52LBE, 52LBDA, only not shown	74	...	.20	.20	.20	.20
Hand Stop Pin not shown	75	.05	.05	.05	.05	.05	
Movement, Complete note below	72	1.50	1.50	1.80	1.80	1.80	

Subject to Discount

When ordering Springs (3-4-5) or Dials (24) it is necessary to specify the maximum pressure, and whether Dials are to be Silvered, Black or White enamel. Specify whether Hands (27) are to be black or white; see page 71. Specify whether Rings are O. G. Style "A" or Flush Style "K" and give style letter; see page 74. It is more economical to order complete new movements than their component parts for reassembling.

ASHTON DUPLEX, CABOOSE AND
SINGLE AIR BRAKE GAGES

LIST PRICES OF PARTS

STYLE NO.			No. 59C No. 59B (Old Style)	No. 51B	No. 51B	No. 51B No. 51C	No. 62C Duplex	No. 62B No. 62BU
SIZE, INCHES			3	3½	4½	5	3½	5
NAME OF PART		Fig.	PRICE, EACH					
Socket Screw	Iron	1	.....	\$0.08	\$0.08	\$0.08	\$0.08	\$0.08
	Nickel Plated							
	Brass	1	.10	.10	.10	.10	.10	.10
Case	Iron	2	1.80 59B only	1.50	1.50	2.00	1.50	2.00
	Aluminum							
	Brass	2	3.00	4.00	4.00	4.50	4.00	4.50
Socket, Spring and Tip, Complete, not furnished separately . . . note below		3-4-5	3.00	1.50	1.60	1.75	} 3.00	3.25
Socket, Spring and Tip, Complete, not furnished separately . . . note below		3-4A-5	.....	...	...	...
Connection Arm, old style		6	.....	.10	.10	.10		
Movement Connection Arm		7	.10	.10	...	...	*2 .10	...
Connection Screw		10	.10	.10	.10	.10	...	...
Movement Arm Connection Screw . . .		10A	.....	...	...	...	.10	.10
Tip Connection Screw		13	.10	.10	.10	.10	.10	.10
Movement Case Screw		14	.10	.10	.10	.10	.10	.10
Adjusting Slide Lock Screw		15	.08	.08	.08	.08	.08	.08
Adjusting Slide		16	.10	.10	.10	.10	.10	.10
Sector		17	.60	.60	.60	.60	Specify Upper or Lower .60	Specify Upper or Lower .60
Pinion, Nickel Silver		18	.40	.40	.40	.40	.40	.40
Hair Spring note below		20	.20	.20	.20	.20	.20	.20
Dial, Silvered or Black note below, not shown		24	1.50	2.00	2.00	2.30	2.50	3.00
Dial, White Enamel note below, not shown		24	.....	...	...	...	2.70	3.20
Ring, Flush Slip		25	Aluminum 1.00	...	...	...	...	...
Ring, Flush or O. G., Threaded . . . not shown		25	.....	2.50	2.50	2.75	2.50	2.75
Ring, Slip, 59B only note below, not shown		25B	1.00	...	...	...	...	...
Dial Screw note below, not shown		26	.05	.05	.05	.05	.05	.05
Hand, Black or Red note below, not shown		27	.15	.15	.15	.20	.15	.20
Glass note below, not shown		34	Celluloid .25 59C	.15	.15	.20	.15	.20
Ring Screw		35	Glass .15 59B	.15	.15	.20	.15	.20
Ring Center Piece { 59B		36	.05	...	...	...	...	...
Cross Bar { only		37	.25	...	...	...	...	...
Cork Gasket, 59B only note below, not shown		38	.20	...	...	...	...	...
Adjustable Link Screw		43	.25	...	...	...	...	...
Adjustable Link, complete		44	.....	...	.10	.10	...	.10
Hand Stop Pin note below, not shown		75	.....	*1 ...	.45	.45	*1 ...	.45
Movement, Complete note below		72	.05	.05	.05	.05	.05	.05
			1.00	1.50	1.50	1.50	3.00	3.00

Subject to Discount

When ordering Springs (3-4-5; 3-4A-5; or Dials 24) it is necessary to specify the maximum pressure. Unless otherwise specified, socket connections will be furnished parallel with back of case.

Specify whether Hands (27) are to be White, Black or Red.

Hair springs for Duplex gages should be specified Upper or Lower.

It is more economical to order complete new movements, than their component parts for reassembling.

*1Solid link (7) in 3½ inch. *2Specify 7 or 7A.

Special Single Spring Pressure, Locomotive Duplex Back Pressure, Quadruplex Air Brake, Master Pilot Locomotive Steam, and Double Dial Locomotive Steam Gages
LIST PRICES OF PARTS

STYLE NO.		No. 51E	No. 62Q	No. 62QI No. 62QE	No. 51S	No. 52D	No. 52DI	No. 62BA	No. 62BAI	No. 62BO	No. 62BP No. 62BPA	No. 62BB
SIZE, INCHES		5	5	5	6	6¾	6¾	6¾	6¾	6¾	6¾	6¾
NAME OF PART	Fig.	PRICE, EACH										
Socket Screw { Iron . . .	1	\$.08			\$0.08	\$0.08	\$0.08	\$0.08	\$0.08	\$0.08	\$0.08	\$0.08
	1, 1A	.10	*1 .10	*1 .10	.10	.10	.10	.10	.10	.10	.10	.10
Case { Iron . . .	2	3.75				8.00	8.00	4.00	4.00	4.00	3.00	4.00
	2	4.25	8.00	*3 8.00	5.50	9.50	9.50	8.00	8.00	8.00	8.00	8.00
†Socket, Spring, Tip, not furnished separately	3-4-5	2.50	*10 5.00	*10 5.00	2.80	3.00	3.00	5.00	5.00	5.00	5.00	7.00
Movement Connection Arm	7	...	...	...	...	.10	.10	...	...	...	...	.10
Lever	8B	...	...	...	...	.20	.20	...	...	...	...	...
Connection Screw . . .	10	...	.10	.10	...	.10	.10	.10	.10	.10	.10	.10
Tip Connection Screw .	13	...	.10	.10	...	.10	.10	.10	.10	.10	.10	.10
Movement Case Screw .	14	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10
Adjusting Slide Lock Screw	15	.08	.08	.08	.08	.08	.08	.08	.08	.08	.08	.08
Adjusting Slide	16	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10
Sector	17	.60	*11 .60	*11 .60	.60	.60	.60	*11 .60	*11 .60	*11 .60	*11 .60	*11 .60
Pinion . . . not shown	18	.40	*11 .40	*11 .40	.40	.40	.40	*11 .40	*11 .40	*11 .40	*11 .40	*11 .40
Hair Spring	20	.20	*11 .20	*11 .20	.20	.20	.20	*11 .20	*11 .20	*11 .20	*11 .20	*11 .20
†Dial	24	2.30	*10 2.80	*10 2.80	*9 2.80	*14 3.00	*14 3.00	*14 4.50	*14 4.50	*14 5.00	*14 4.00	*14 5.00
†Dial, Rotating, No. 62BP and 62BPA only	24R	...	...	...	...	...	...	...	...	...	2.60	...
Ring or Cover	25	2.75	1.50	1.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
Dial Screw	26	.05	.05	.05	.05	.05	.05	.05	.05	.05	.05	.05
Hand	27	.20	*12 .20	*12 .20	.20	*13 .20	*13 .20	*15 .20	*15 .20	*15 .20	*13 .20	*15 .20
Glass . . . not shown	34	.15	.30	.30	.20	.20	.20	.20	.20	.20	.20	.20
Tension Spring	37	.60	...	...	.60	...	...	.60	.60	.60	.60	...
Spring Stop Post	38	.40	...	...	.40	...	...	.40	.40	.40	.40	.40
Connection Arm Screw .	39	.20	...	...	.20	...	...	.20	.20	.20	.20	...
Connection Arm	40	.40	...	...	.40	...	...	.30	.30	.30	.30	...
Spring Stop Post Screw .	41	.10	...	...	.10	...	...	.10	.10	.10	.10	.10
Spring Stop Post Washer	42	.05	...	...	.05	...	...	.05	.05	.05	.05	.05
Adjustable Link Screw .	43	...	.10	.10	...	.10	.10	.10	.10	.10	.10	.10
Adjustable Link, complete	44	...	.45	.45	...	.50	.50	.50	.50	.50	.50	.50
Lamp Case or Frame . . .	45	...	...	3.00	...	...	3.00	...	3.00	...	...	...
Lamp Case Cover	46	...	...	*2 2.25	...	...	*6 2.25	...	2.25	...	...	...
Receptable Holder . . .	47	...	...	1.50	...	...	1.50	...	1.50	...	...	...
Receptacle or Lamp Socket	48	...	...	.70	...	...	.70	...	.70	...	...	...
Receptacle Washer . . .	49	...	...	.20	...	...	.20	...	.20	...	...	...
Gasket	50	...	.50	.50	...	...	...	...	...	...	...	...
Lamp and Gage Case												
Cover Screw	35, 51	...	.10	.10	...	...	.10	...	.10	...	...	...
Movement Lift not shown	53	...	...	...	...	...	...	.20	.20	.20	.20	.20
Receptacle Holder Screw	54	...	...	.10	...	...	.10	...	.10	...	...	...
Transparent Slot Cover .	57	...	...	*3 .40	...	...	...	...	...	...	...	...
Lighting Attachment, complete	45, 46, 47, 48, 49, 51	...	...	*4 8.00	...	...	10.00	...	10.00	...	...	...
Lazy Hand . . . not shown		...	...	...	...	...	...	*5 1.50	*5 1.50	*5 1.50	...	...
Hand Stop Pin	75	...	.05	.05	...	.05	.05	...	...	...	...	...
Tip Connection Link, No. 62BB only	76	...	...	...	...	...	...	...	...	...	...	.50
Adjustable Take-Up Link No. 62BB only	77	...	...	...	...	...	...	...	...	...	...	2.00
Take-Up Link, No. 62BB only	78	...	...	...	...	...	...	...	...	...	...	1.00
Pivot Post, No. 62BB only	79	...	...	...	...	...	...	...	...	...	...	1.00
†Movement, complete	*872	1.50	*10 3.00	*10 3.00	1.80	2.50	2.50	3.00	3.00	3.00	3.00	5.00

† When ordering Springs (3, 4 and 5) or Dials (24) specify the maximum pressure. For style of Hands (27) see page 71. *11 and 1A for 62Q, 62QI and 62QE. *246 for 62QE; 46A for 62QI. *357 and 2A used on 62QI only. *4For No. 62QE 45, 46, 47, 48, 49, 51. For No. 62QI 45, 46A, 47, 48, 49, 51, 57. *5Add "A" to No.; e.g., 62BAIA. *6Specify right or left, facing tapped hole on lamp case frame (45). *8It is more economical to order complete new movements than their component parts for reassembling. *9White porcelain or black. *10Specify maximum pressure and clockwise or counter clockwise graduations. Specify left or right. *11Specify upper or lower. *12Specify black or red. *13Specify black or white. *14Specify silver or black. *15Specify black or white, long or short. Subject to discount.

ASHTON LOCOMOTIVE STEAM AND
STEAM HEAT GAGES
Old Style
LIST PRICES OF PARTS

STYLE NO.			No. 52 No. 52R	No. 52J (Dust Proof) No. 52R	No. 52RA (Dust Proof)	No. 52J (Dust Proof) No. 52R	No. 52RA (Dust Proof)	No. 52J (Dust Proof) No. 52R	No. 52RA (Dust Proof)
SIZE, INCHES			4½	5	6	6¾			
NAME OF PART	Fig.	PRICE, EACH							
Socket Screw { Iron	1	\$0.08	\$0.08	\$0.08	\$0.08				
Socket Screw { Brass	1	.10	.10	.10	.10				
Case, Iron, Nos. 52, 52A, 52R, 66, only	2	1.50	2.00	3.00	3.50				
Case, Iron, Dust Proof, Nos. 52J, 52RA, only	2	...	2.50	3.50	4.00				
Case, Brass	2	4.00	4.50	5.50	6.50				
Case, Brass, Dust Proof, No. 52J, No. 52RA, only	2	...	5.00	6.00	7.00				
Socket, Spring and Tip, Complete (not furnished separately, note below)	3-4-5	2.00	2.50	2.80	3.00				
Connection Arm, Nos. 52 and 52J, only	6	.10	.10	.10	.10				
Lever	8	.30	.30	.50	.50				
Hub	9	.65	.65	.65	.65				
Hub Screw	11	.10	.10	.10	.10				
Hub Lock Screw	12	.10	.10	.10	.10				
Tip Connection Screw	13	.10	.10	.10	.10				
Tip Connection Screw	13A	.10	.10	.10	.10				
Movement Case Screw	14	.10	.10	.10	.10				
Pinion, Nickel Silver	18	.40	.40	.40	.40				
Bushing, Nickel Silver	19	.20	.20	.20	.20				
Hair Spring	20	.20	.20	.20	.20				
Dial, Silvered or Black, note below	24	2.00	2.30	2.80	3.00				
Dial, White Enamel, note below	24	2.20	2.50	3.00	3.30				
Ring, O. G. or Flush, Threaded note below	25	2.50	2.75	3.00	3.50				
Ring Threaded, Dust Proof, Nos. 52J and 52RA, only	25	...	3.00	3.50	4.00				
Dial Screw	26	.05	.05	.05	.05				
Hand, Black or White note below	27	.15	.20	.20	.20				
Rack, Nickel Silver	28	.40	.40	.40	.40				
Bushing Screw, Nickel Silver	29	.10	.10	.10	.10				
Rack Adjusting Screw	30	.15	.15	.15	.15				
Rack Connecting Screw	31	.10	.10	.10	.10				
Movement Frame	32	.50	.50	.50	.50				
Glass } not shown	34	.15	.15	.20	.20				
Adjustable Link Screw	43	.10	.10	.10	.10				
Adjustable Link, Complete	44A	.45	.45	.50	.50				
Rack Adjusting Screw, Lock Nut	73	.10	.10	.10	.10				
Felt, No. 52J, No. 52RA, only not shown	74	...	.20	.20	.20				
Hand Stop Pin not shown	75	.05	.05	.05	.05				
Movement, complete note below	72	1.50	1.50	1.80	1.80				

Subject to Discount

When ordering Springs (3-4-5) or Dials (24) it is necessary to specify the maximum pressure, and whether dials are to be silvered, black, or white enamel.
Specify whether hands are to be white or black and give size, see page 71.
Specify whether rings are O. G. or Flush and give style letter.
It is more economical to order complete new movements than their component parts for reassembling.

ASHTON IMPROVED DEAD-WEIGHT
PRESSURE GAGE TESTER

LIST PRICES OF PARTS

‡A.	Body: Double Area	\$22.00
	Single Area (old style) (note below)	22.00
‡B.	Plunger: Double Area	12.00
	Single Arca (old style) (note below)	12.00
C.	Plug	1.00
*D.	Pump Cylinder	3.50
*E.	Pressurc End of Pump Cylinder	2.50
§F.	Pump Cylinder Nut	3.00
§G.	Pump Plunger Screw	3.75
H.	Follower	1.75
I.	Follower Nut . . . . .	.90
J.	Cup Leather . . . . .	.50
L.	Handwheel	2.00
M.	Handwheel Nut . . . . .	.35
N.	Leather Washer . . . . .	.10
O.	Oil Overflow Cup	3.00
‡P.	Weight Holder	5.75
Q.	Cup Leather Washer Nut . . . . .	.20
R.	Bonnet for Needle Valve of Pressure By-Pass . . . . .	.80
S.	By-Pass Needle Valve	1.40
T.	Packing Nut . . . . .	.35
U.	Cover to replace O when Tester is not in use	2.00
V.	Packing Nut . . . . .	.35
W.	Bonnet for Atmosphere Needle Valve . . . . .	.80
X.	Atmosphere Needle Valve	1.40
†Y.	Washer for Three-Way Cock . . . . .	.05
†Z.	Screw for Three-Way Cock . . . . .	.10
†AA.	Three-Way Cock Body	10.00
†BB.	Three-Way Cock Plug	8.00
†CC.	Coupling Nut . . . . .	.90
†DD.	1/8 inch Female Connection	1.50
EE.	1/8 inch Male Connection	1.50
FF.	1/4 inch Female Connection	1.50
GG.	1/4 inch Male Connection	1.50
HH.	3/8 inch Female Connection	1.50
II.	3/8 inch Male Connection	1.50
JJ.	Washer for Cup Leather . . . . .	.25
KK.	Drip Pipe . . . . .	.25
†LL.	Tail Pipe	1.25

Pressed Steel Box for Weights	\$11.00
Pressed Steel Box for Instruments	18.00

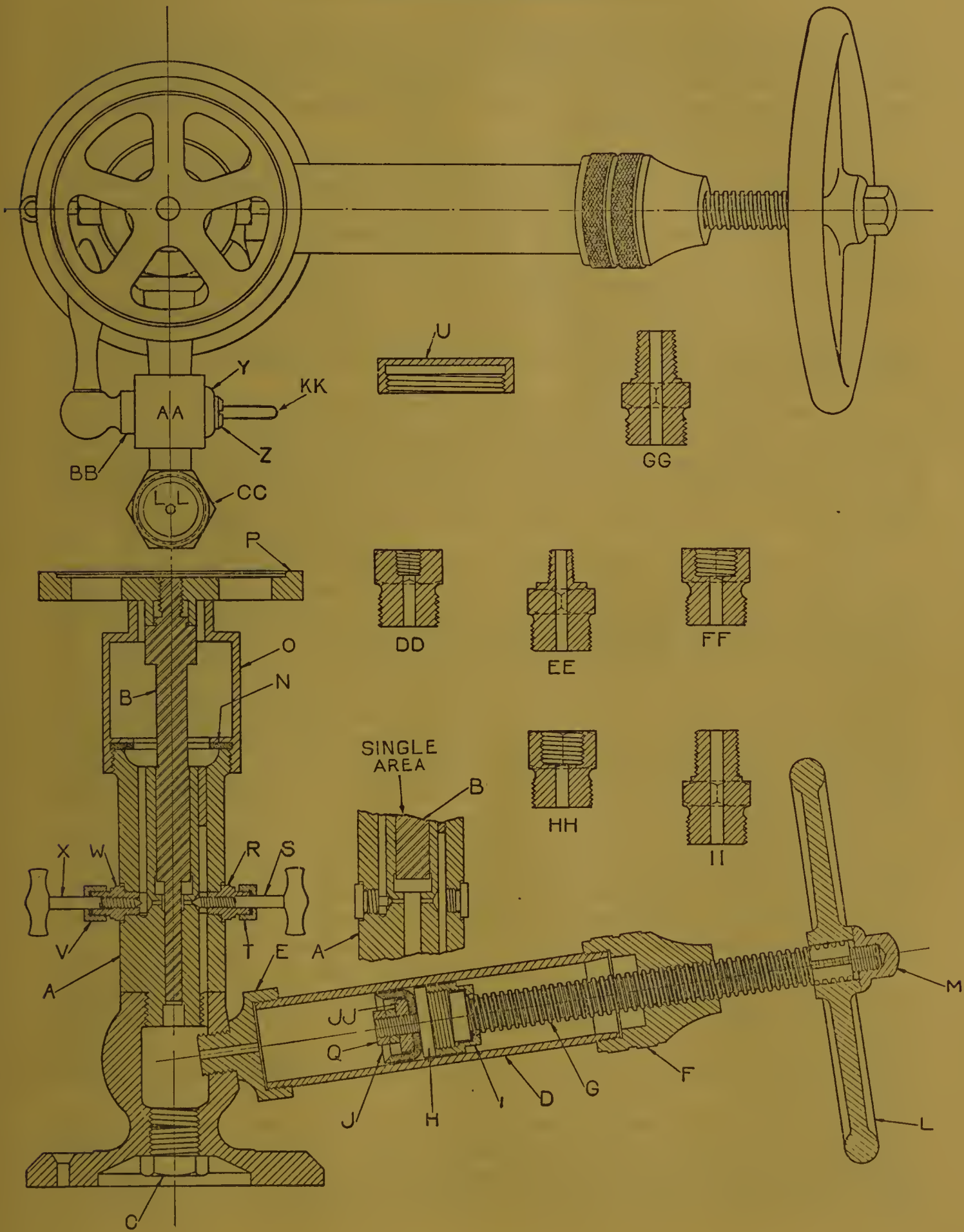
	PRESSURE ON GAGE		
	Single or Combined	Small	
1/4 pound Weight	1 1/4 lbs.	5 lbs.	2.25
1/2 pound Weight	2 1/2 lbs.	10 lbs.	2.50
1 pound Weight	5 lbs.	20 lbs.	2.75
2 pound Weight	10 lbs.	40 lbs.	3.25
4 pound Weight	20 lbs.	80 lbs.	4.00

*†‡§ We recommend that the following parts be purchased assembled to insure proper fitting and accuracy. In ordering parts A and B speeify whether double area, or single area (old style).

*D, E, Pump Cylinder Assembled	\$7.00
†AA, BB, CC, KK, LL, Y and Z, Three-Way Cock Assembled	23.40
‡A, B and P, Body, Plunger and Weight Holder Assembled	37.60
§F, G, Pump Cylinder Nut and Pump Plunger Screw Assembled	6.75

ASHTON IMPROVED DEAD-WEIGHT
PRESSURE GAGE TESTER

LIST OF PARTS



ASHTON IMPROVED DEAD-WEIGHT PRESSURE GAGE TESTER

DIRECTIONS FOR OPERATING

Place the Tester on a table or bench that is level, so that the weight plunger will stand exactly vertical and work smoothly in the upright cylinder without friction on any side, which might otherwise give a false reading. Thoroughly clean all interior parts, which must be entirely free from grit or dirt. The best results are obtained by using only sperm oil in the machine.

When ready to fill the Tester with oil, the three-way cock on the gage connection arm should be closed by turning the lever handle to a vertical position. The hand wheel should be screwed into the oil reservoir as far as it will go. The cap on top of cylinder having been removed and the overflow cup screwed on in place of it, the oil can then be slowly poured into the cylinder, and the hand wheel gradually unscrewed until the instrument is completely filled.

The gage to be tested can now be applied, as shown in the cut and the three-way cock opened by turning lever handle to a horizontal position to the right. The plunger with weight holder may then be inserted in cylinder, making Tester complete and ready for use.

To insure accuracy of readings, THE PLUNGER SHOULD BE REVOLVED SLOWLY to reduce any friction there might be in the cylinder. As the plunger is forced downward by the weights applied, the hand wheel should be screwed in more and more. The overflow cup is of such a height as to prevent plunger from striking the bottom. Do not force the weight plunger up too high; three-eighths inch is sufficient.

When testing at low pressures, the machine should be adjusted to use the combined large and small area of plunger. This is accomplished by closing the cock on left-hand side of vertical cylinder and opening the right-hand one. For testing at high pressures no additional weights are required, it being merely necessary to reverse the adjustment of the cylinder cocks. The one on the left should be opened and that on the right closed as shown in cut. This makes use of only the small area of the plunger, and the pressure then exerted will be four times as great as before, and applies to the weight holder as well as to each of the weights, increasing the testing capacity to full maximum. BEFORE MAKING THIS CHANGE, IT IS ALWAYS ADVISABLE TO REMOVE ALL PRESSURE IN THE TESTER BY UNSCREWING THE HAND WHEEL.

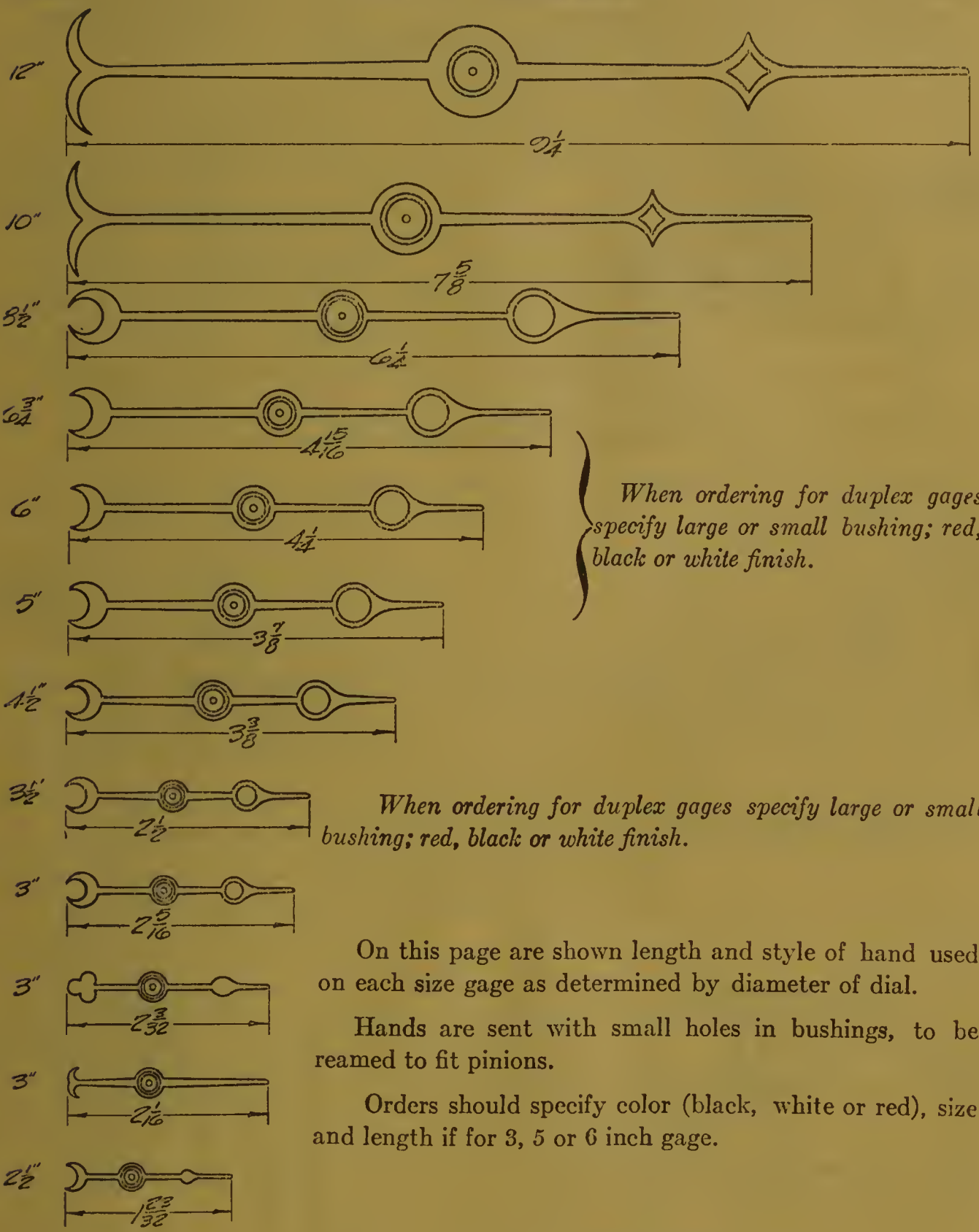
The plunger and weight holder will exert a pressure on the gage of exactly five pounds with combined area adjustment (or twenty pounds with small area), and by adding the various weights the desired maximum pressure can be obtained. Each weight is marked with the number of pounds per square inch it will exert on the gage with either combined area adjustment or small area adjustment. See page 68.

When each test is completed the three-way cock should be closed by turning lever back to vertical position, which will shut off the connection to gage, as well as drain the oil from it into the oil can, which should be placed under the drain cock. The gage then can be removed and another one applied and three-way cock opened again. Never attempt to take off the weights or plunger without first unscrewing hand wheel as far as it will go.

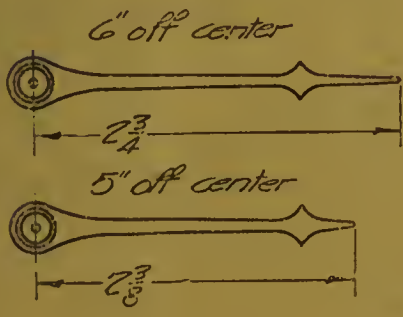
The oil may be left in the machine, when not in use, but the plunger should be taken out and carefully cleaned before being put away. The cap should be screwed on to the top of the cylinder to prevent dirt from entering. To completely drain all oil from the machine turn the three-way cock handle horizontally to the left.

SIZE

GAGE HANDS



PRICES, EACH



SIZE	
2 1/2 to 4 1/2 inch inclusive	\$0.15
5 to 6 3/4 inch inclusive . . . . .	.20
8 1/2 inch . . . . .	.30
10 inch . . . . .	.40
12 inch . . . . .	.50

METHOD OF INSTALLING ASHTON WHEEL PRESS RECORDING GAGE ATTACHMENTS For Double Mounting

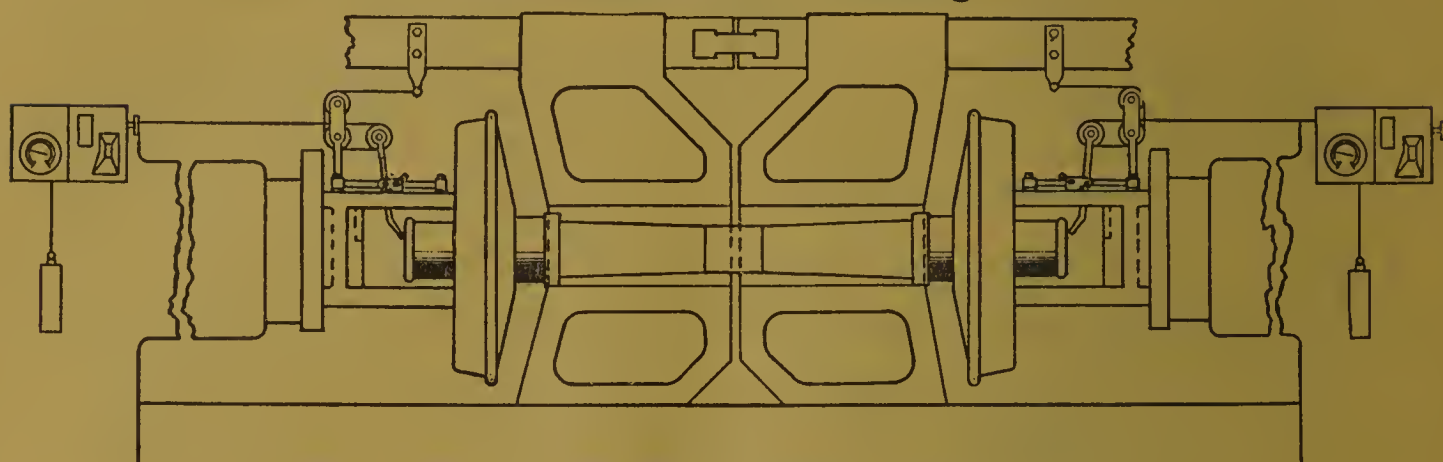


Figure 1. Double Ram Press

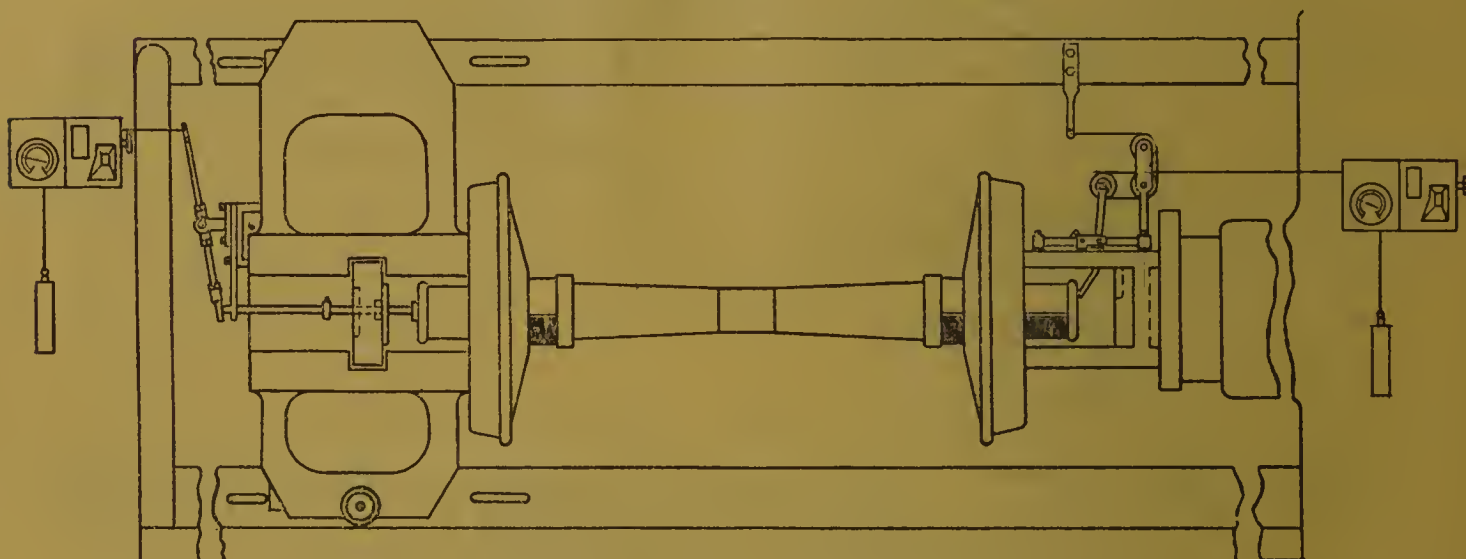


Fig. 2. Single Ram Press

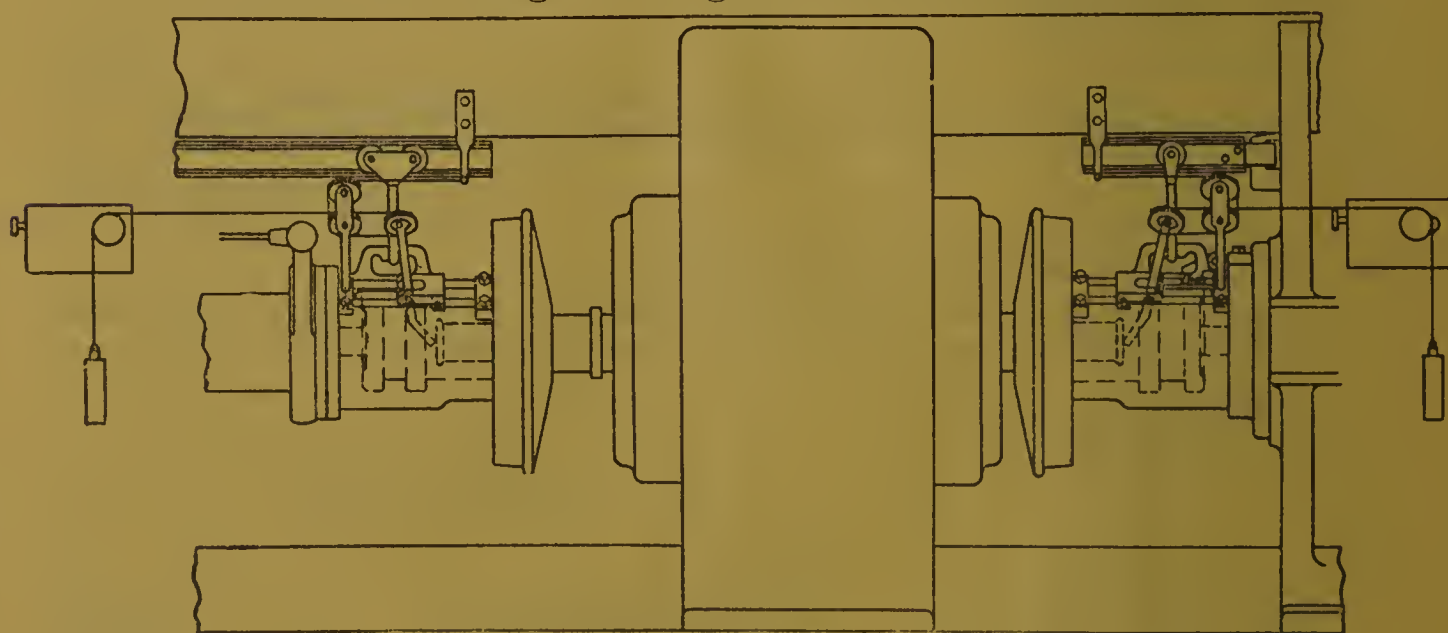


Fig. 3. Single Ram Press. Rear View

The cuts illustrate the application of the attachments to a double and two styles of single ram presses, for double mounting.

Patented, U. S. No. 1,669,559

WHEEL PRESS RECORDING GAGE ATTACHMENTS

Figs. 1 and 3 show the attachments for adapting the recorder for use with a double ram press and one style of single ram press, also method of installation.

The essential parts of the mechanism are two arms attached to each ram shoe, each of which has one or more sheaves at the top, around which passes the cable that operates the gage. One of these arms is rigid and the other, the lower end of which bears on the end of the axle, is pivoted and free to move with any relative movement of wheel and axle. This movement separates the sheaves, changing the distance between the ends of cable and actuates the recording device.

Filler blocks are recessed to clear the ends of pivoted arms.

When either wheel moves with the axle, the sheaves will move along the cable but will not change the distance between the ends and movement will not be recorded.

A spring or weight is used to return the movable arm to normal position, allowing the recording gage to return to zero when the wheels and axle have been removed.

Fig. 2 shows the attachments for another style of single ram press. As will be seen in the cut, the parts for the ram end are the same as those used on the double ram press. The other parts consist of a horizontal rod properly supported against the end of axle and a lever suitably supported, to the other end of which is attached the cable leading to the sprocket chain on recording gage. The following notes apply to both double and single ram presses.

Cable anchors are to be made by user to suit conditions; not furnished with attachments.

Recording gages should be mounted on rigid supports separate from press, if necessary, to avoid vibration.

It is important that cables to recording gages and anchors on press shall leave the sheaves on attachments in a line parallel to motion of sheaves, after which guide sheaves on stationary centers may be used if necessary.

When attachments are used, the travel indicated on chart is approximately twice the length of wheel fit.

Orders should specify style of press (single or double ram and maker's name), size of ram, right and left-hand recorders, one set of attachments, and maximum graduation on charts. We recommend two hundred tons for car wheel presses and three hundred tons for driving wheel presses.

GAGE RING STYLES



A-B-C-D



F-G-H



J



L-M



K



E



N



O



P



Q



R



S

- A. O. G., Cast, Threaded
- B. O. G., Cast, Slip
- C. O. G., Spun
- D. O. G., Cast, Hinged
- E. Bevel, Glass Spun In
- F. Flush, Cast, Threaded
- G. Flush, Cast, Hinged
- H. Flush, Cast, Slip
- J. Flush, Spun

- K. Locomotive Flush, Cast, Threaded
- L. Flush, Cast, Threaded, Knurled
- M. Flush, Cast, Slip, Knurled
- N. Illuminated (for No. 62D only)
- O. Protected Dial, Old Style
- P. Protected Dial, New Style
- Q. Bevel, Slip Glass
- R. Flush, Cast, Threaded, Knurled
- S. Quadruplex

INDEX

	PAGE
Air Brake Gage, Design and Description	51
Air Brake Gage, Duplex, Single Spring, No. 62B, 62 B. U.	55
Air Brake Gage, Duplex, Single Spring, No. 62C	56
Air Brake Gage, Protected Dial, Single Spring, No. 59C	61
Air Brake Gage, Quadruplex, Single Spring, No. 62, 62 Q. I.	63
Air Brake Gage, Single, No. 51, 51B, 51C	53
Attachments, Wheel Press Recording Gage	72, 73
Back Pressure Gages, Locomotive, Information for Application and Service	52
Back Pressure Gages, Locomotive, Duplex, No. 62 B. A., 62 B. O., 62 B. P., 62 B. P. A.	58, 59
Bolted Type Safety Valves, Instructions	36, 37
Cam Lever Muffled Valve, No. 30 M. M. A.	24
Cam Lever Open Pop, No. 28 M. M. A.	16
Capacity Chart, Valve	28, 29
Capacity, Discharge	27
Care and Repair of Gages, Special Instructions on	50
Connections, Safety Valve Locomotive Dome	44, 45, 46
Dead Weight Gage Testers	68
Dead Weight Gage Testers, Directions	70
Dead Weight Gage Testers, Illustration	69
Design and Description, Gages	51
Design and Description, Safety Valves	6
Design and Dimensions, Wing Valves	30, 31
Device, Pulsation Retard, No. 120	53
Discharge Capacity of Locomotive Valves	27
Dome Connections	44, 45, 46
Double Dial Locomotive Steam Gage, No. 52 D, 52 D. I.	60
Double Spring Locomotive Steam Gage, No. 52, 52J, 52 L. B., 52 L. B. E., 52 R, 52 R. A., 52 L. B. D., 52 L. B. D. A., 52 U. S., 66, 52 L. B. D. B.	54
Double Spring Locomotive Steam Heat Gage, No. 52A	51, 54
Double Spring Locomotive Steam Heat Gage, Parts, No. 52A	54
Duplex Air Brake Gage, Single Spring, No. 62B, 62 B. U.	55
Duplex Air Brake Gage, Single Spring, No. 62C	56
Duplex Back Pressure and Vacuum Gage, Locomotive	58, 59
Feed Water Heater Gages, No. 51E, 51S	62
Fixture, Lathe, Reseating	40, 41
Gage, Air Brake, Protected Dial, No. 59C	61
Gage, Double Dial Locomotive Steam, No. 52D, 52 D. I.	60
Gage, Double Spring, No. 52, 52A, 66	54
Gage, Duplex Air Brake, Single Spring, No. 62B, 62 B. U.	55
Gage, Duplex Air Brake, Single Spring, No. 62C	56
Gage Hands	71
Gage, Improved Double Spring, No. 52 L. B., 52 U. S., etc.	51, 54
Gage, Locomotive Back Pressure, Information for Application and Service	52
Gage, Locomotive Duplex Back Pressure and Vacuum, No. 62 B. A., 62 B. O., 62 B. P., 62 B. A. A.	58, 59
Gage, Locomotive Feed Water Heater, No. 51E, 51S	62
Gage, Locomotive Master Pilot, No. 62 B. B.	57
Gage, Locomotive Pressure	47
Gage, Locomotive Quadruplex Air Brake, No. 62 Q, 62 Q. I.	63
Gage Parts, List of	53-63
Gage Parts, Price List	64, 65, 66, 67
Gage Ring, Styles	74
Gage, Single Spring, No. 51, 51B, 51C	53
Gage, Special Single Spring, No. 51E, 51S	62
Gage, Steam Heat, No. 52A	51
Gage, Steam Heat, List of Parts, No. 52A	54

	PAGE
Gage Testers and List of Parts	68
Gage Testers, Directions	70
Gage Testers, Illustration	69
Gage, Wheel Press Recording, Attachments	72, 73
Gages, Design and Description	51
Gages, General Information	48
Gages, Information for Application and Service of Locomotive Back Pressure	52
Gages, Instructions for Ordering	49
Gages, Instructions for Repairing	50
Gages, Locomotive Pressure	47
Gages, Price List of Parts	64, 65, 66, 67
Gages, Repaired	48
Gages, Special Instructions on Care and Repair	50
General Information on Gages	48
General Information on Safety Valves	4
General Instructions for Locomotive Muffled and Open Pop Safety Valves	34
Hands, Gage	71
Heater Gages, Locomotive Feed Water, No. 51E, 51S	62
Increased Lift Muffled Valves	23
Increased Lift Open Pop Valves	15
Information for Application and Service of Locomotive Back Pressure Gages	52
Information on Gages, General	48
Information on Safety Valves	4
Instructions for Gage Testers	70
Instructions for Gages and Parts, Ordering	49
Instructions for Safety Valves and Parts, Ordering	5
Instructions for Safety Valves, Repairing, Setting, Regulating	34
Instructions for Safety Valves, Bolted Type, Repairing	36, 37
Instructions for Safety Valves, Screwed Type, Repairing	38, 39
Instructions, General, for Locomotive Muffled and Open Pop Safety Valves	34
Instructions on Gages, Care and Repair	50
Lane Bourdon Locomotive Steam Gage	54
Lathe Fixture, Safety Valve Reseating	40, 41
List of Gage Parts	53-63
List of Valve Parts	7, 8, 13, 14, 15, 16, 17, 21, 22, 23, 24, 25
List Price of Gage Parts	64, 65, 66, 67
List Price of Valve Parts	42, 43
Locomotive Back Pressure Gages, Information for Application and Service of	52
Locomotive Double Dial Steam Gage, No. 52 D, 52 D. I.	60
Locomotive Duplex Back Pressure and Vacuum Gages, No. 62 B. A., 62 B. O., 62 B. P., 62 B. P. A.	58, 59
Locomotive Feed Water Heater Gages, No. 51E, 51S	62
Locomotive Master Pilot Gage, No. 62 B. B.	57
Locomotive Pressure Gages	47
Locomotive Safety Valve, Connections	44, 45, 46
Locomotive Safety Valve, Design and Description	6
Locomotive Special Single Spring Gage, No. 51E, 51S	62
Locomotive Steam and Air Gages	51
Master Mechanic's Muffled Valves	22
Master Mechanic's Open Pop Valves	14
Master Pilot Gage, Locomotive, No. 62 B. B.	57
Muffled Safety Valves, No. 30	17, 18, 19, 20
Muffled Safety Valves, No. 30 M. M. A.	24
Muffled Safety Valves, No. 30B	25
Muffled Safety Valves, No. 30C	21
Muffled Safety Valves, No. 30D	26
Muffled Safety Valves, No. 30 I. L., 30 I. L. A.	23
Muffled Safety Valves, No. 30 M. M., 30 M. M. B.	22

	PAGE
Muffled Wing Valves	30, 31
Muffled Wing Valves, Templates	32
Nipples, Safety Valve Space	44, 45, 46
Open Pop Safety Valves, No. 26C	7
Open Pop Safety Valves, No. 28	8, 9, 10, 11
Open Pop Safety Valves, No. 28A	12
Open Pop Safety Valves, No. 28B	13
Open Pop Safety Valves, No. 28 I. L., 28 I. L. A.	15
Open Pop Safety Valves, No. 28 M. M., 28 M. M. B., 28 U. S.	14
Open Pop Safety Valves, No. 28 M. M. A.	16
Open Pop Wing Valves	30, 31
Open Pop Wing Valves, Templates	32
Ordering Gages, Instructions	49
Ordering Safety Valves, Instructions	5
Parts, Gage, Instructions for Ordering	49
Parts, Gage, List of	53-63
Parts, Gage, Price Lists of	64, 65, 66, 67
Parts, Safety Valves, Instructions for Ordering	5
Parts, Safety Valves, List of	7, 8, 13, 14, 15, 16, 17, 21, 22, 23, 24, 25
Parts, Safety Valves, List Prices	42, 43
Pilot Gage, Locomotive Master, No. 62 B. B.	57
Price List of Gage Parts	64, 65, 66, 67
Price List of Safety Valve Parts	42, 43
Protected Dial Air Brake Gage, No. 59C	61
Pulsation Retard Device, No. 120	53
Quadruplex Air Brake Gage, No. 62 Q, 62 Q. I.	63
Reconstruction Safety Valves	4
Recording Gage Attachments, Wheel Press	72
Repairing Safety Valves, Bolted Type	36, 37
Repairing Safety Valves, General Instructions	34
Repairing Safety Valves, Screwed Type	38, 39
Repairing Steam and Air Gages	48, 50
Reseating Fixture, Safety Valve	40, 41
Retard Device, Pulsation, No. 120	53
Ring Styles, Gage	74
Safety Valves, Bolted Type, Repairing	36, 37
Safety Valves, Capacity Chart	28, 29
Safety Valves, Design and Description	6
Safety Valves, Discharge Capacity	27
Safety Valves, General Information on	4
Safety Valves, Instructions for Ordering	5
Safety Valves, Lathe Fixture for Reseating	40, 41
Safety Valves, Repairing	34, 35
Safety Valves, Setting	34, 35
Screwed Type Safety Valve, Instructions	38, 39
Seat Templates, Valve	32
Section of Wing Valve and Bottom	33
Setting Safety Valves, Instructions	34, 35
Single Spring Gage, No. 51	51
Space Nipples for Valve and Dome Connections	44, 45, 46
Special Instructions on Care of and Repairs to Gages	50
Special Single Spring Pressure Gage, No. 51E, 51S	62
Steam Gage, Locomotive, No. 52, 52 J., 52 L. B., 52 L. B. E., 52 R., 52 R. A., 52 L. B. D., 52 L. B. D. A., 52 U. S., 66, 52 L. B. D. B.	54
Steam Gage, Locomotive, Double Dial, No. 52D., 52 D. I.	60
Steam Gage, Locomotive, Duplex Back Pressure and Vacuum, No. 62 B. A., 62 B. O., 62 B. P., 62 B. P. A.	58, 59
Steam Gage, Locomotive, Master Pilot, No. 62 B. B.	57

	PAGE
Steam Heat Gage, No. 52A, Double Spring	51
Steam Heat Gage, No. 52A, Parts	54
Steam Heat Gage, No. 51, 51B, 51C, Single Spring	51, 53
Styles, Gage Ring	74
Templates, Wing Valves and Seats	32
Testers, Gage and List of Parts	68
Testers, Gage, Directions.	70
Testers, Gage, Illustrations	69
Valve, Capacity Charts	28, 29
Valve, Discharge Capacity	27
Valve, Lathe Fixture for Reseating	40, 41
Valve, Locomotive Connections	44, 45, 46
Valve, Locomotive Muffled, No. 30	17, 18, 19, 20
Valve, Locomotive Muffled, No. 30 M. M. A.	24
Valve, Locomotive Muffled, No. 30B	25
Valve, Locomotive Muffled, No. 30C	21
Valve, Locomotive Muffled, No. 30D	26
Valve, Locomotive Muffled, No. 30 I. L., 30 I. L. A.	23
Valve, Locomotive Muffled, No. 30 M. M., 30 M. M. B.	22
Valve, Locomotive Open Pop, No. 26C	7
Valve, Locomotive Open Pop, No. 28	8, 9, 10, 11
Valve, Locomotive Open Pop, No. 28A	12
Valve, Locomotive Open Pop, No. 28B	13
Valve, Locomotive Open Pop, No. 28 I. L., 28 I. L. A.	15
Valve, Locomotive Open Pop, No. 28 M. M., 28 M. M. B., 28 U. S.	14
Valve, Locomotive Open Pop, No. 28 M. M. A.	16
Valve, Locomotive Safety, Design and Description	6
Valve, Locomotive Safety, General Information	4
Valve, Locomotive Safety, Instructions for Ordering	5
Valve, Locomotive Safety, Instructions for Repairing	34, 35
Valve, Locomotive Safety, Instructions for Setting and Regulating	34, 35
Valve, Locomotive Safety, List Prices of Parts	42, 43
Valve, Locomotive Safety, Reconstruction	4
Valve, Locomotive Space Nipples	44, 45, 46
Valve, Seat Templates	32
Valve, Wing Valve, Open Pop and Muffled	30, 31
Valve, Wing Valve, Section of	33
Valve, Wing Valve, Templates	32
Wheel Press Recording Gage Attachments	72, 73
Wing Valve and Bottom, Section of	33
Wing Valve, Designs and Dimensions	30, 31
Wing Valve, Templates	32

